COGNITIVE BIASES AND INVESTOR PROTECTION REGULATION
AN EVOLUTIONARY APPROACH∗

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Abstract

Based on the findings of cognitive psychology and experimental economics, Behavioural Decision Theory (BDT) has mounted a powerful challenge on the Standard Social Sciences Model of hyper-rationality. In this mode, the notion of fully informed investors making rational choices in order to maximize gains, one of the main theoretical foundations of modern investor protection regulation, has been heavily challenged. Although BDT’s findings are not as inconsistent with rational choice theory as initially suggested, this does not mean that public policy-makers and financial market regulators should ignore the least controversial of the findings of BDT. This article provides a number of suggestions for the gradual incorporation of certain of BDT’s insights, such as those explaining investors’ bounded rationality and the impact of specific cognitive biases, in four areas of investor protection regulation: investment advice, investment promotions, mandatory disclosure, and asset management. Suggested measures include further fragmentation of investor classes for the purposes of protective regulation, pluralism in the prescribed volume of information disclosed to various investor classes, regulatory prescriptions of the structure (‘framing’) of investment promotions, and the mandatory use of long-term performance targets for fund managers. Although such measures would amount to soft paternalism, they are justified by the distracting effect of certain cognitive biases on investor and market welfare. Furthermore, the use of economic experiments, can facilitate the identification of optimal disclosure formats and assist in the ex ante evaluation of new regulatory measures.

Keywords: Investor protection regulation, FSA, conduct of business rules, mandatory disclosure, cognitive biases, psychology of choice and judgment, framing effect, behavioural finance, stock market bubbles, experimental economics.
1. Introduction

One of the most important contemporary challenges facing policy-makers and regulators in the field of financial markets refers to the impact of individual and institutional investor cognitive (behavioural) biases on the choice of investments and the pursuit of welfare enhancing trading and investment strategies. The regulatory framework governing the workings of investment markets is, inter alia, based on the model of rational investor who possesses unlimited capacity to process information in order to maximize profit. Arguably, most investors’ computational capacity and trading behaviour does not conform to this model. The analysis of the impact of cognitive processes (heuristics) and biases on the rational investor model, as incorporated in contemporary financial market regulation, has followed closely the more general assault carried by Behavioural Decision Theory (BDT) scholars on the Standard Socio-economic Science Model (SSSM) of hyper-rationality.

The SSSM underscores a concept of rational order that intellectually goes back to the Greek philosopher Aristotle\(^2\) and has been systematically processed by the 17th

\(^{1}\) The term Behavioral decision theory seems to have first been used in published work by Ward Edwards in W. Edwards, ‘Behavioral Decision Theory’ (1961) 12 Annual Review of Psychology 473. The term was initially used to describe psychological tests of the descriptive accuracy of normative approaches to decision making.

\(^{2}\) Aristotle, *Nicomachean Ethics* (Book VI), The Clarendon Aristotle Series (1999). In *Nicomachean Ethics* Aristotle offers a theory of the psychê (soul, spirit) in which rationality is one of two basic categories of behaviour. It is as well that Aristotle was also the first philosopher that attempted to systematically explain and classify emotion. Interestingly he set that analysis in the 2nd book *On Rhetoric* (the Greek term for the art of persuasion). Under Aristotle’s analysis emotion is based on the interplay between the rational and irrational parts of human soul; it involves Being and Being’s cognition of itself, and its dialectical encounter with the faculty of pure reason. The result of this discourse is the birth of human emotion. See for the translated text
century French philosopher and mathematician Descartes\textsuperscript{3} and his 19\textsuperscript{th} and 20\textsuperscript{th} century heirs in the field of social sciences. Representative examples of the SSSM constitute the assumption of perfect competition in neoclassical economics, Max Weber’s theory of bureaucracy, and Posner’s hyper-rational utility maximizing judge.\textsuperscript{4} Although hyper-rationality is only a theoretical construction used to create order, clarity and coherence within social sciences, it does pose problems to the extent that real life situations that do not fit within the model of hyper-rationality are excluded from the theoretical model on which an action is based. It is this aspect of the SSSM which has been the main focus of BDT scholars’ criticism/revisionism and it is the main thrust of most contemporary debate about the optimal structure of consumer/investor protection regulation.

BDT, defined here as the interdisciplinary intellectual movement that incorporates empirical theories of decision making,\textsuperscript{5} has its roots mostly in cognitive psychology and, to some extent, in the laboratory tests of economic theory doctrines. The procedures and findings of research carried in the first field comprise so-called psychology of judgement and commentary George A. Kennedy, \textit{On Rhetoric: A Theory of Civic Discourse by Aristotle} (1991).

\textsuperscript{3} The 17\textsuperscript{th} century French philosopher René Descartes discarded emotion and found the soul to be merely the activity of thought, of rationality prior to thinking about a subject. The rational soul is what distinguishes man from animal. Once, by use of reason, man understands the cause of elements, proper method allows for the clear and certain elaboration of human knowledge of the world as a systematic whole. Descartes argued that all worthwhile social institutions were and should be created by conscious deductive processes of human reason. Truth (including truth about the divine) must be derived and be derivable from premises that are obvious and unassailable. See René Descartes, \textit{The Principles of Philosophy} [1644], in \textit{The Philosophical Works of Descartes} v. 1, trans by Elizabeth Haldane and G.R.T. Ross (1969) and Descartes, \textit{Discourse on the Method of Rightly Conducting the Reason, and Seeking the Truth in the Sciences} [1637] translation and introduction by D. M. Clarke (1999).

\textsuperscript{4} For a review see Richard Posner, \textit{Economic Analysis of Law} (6\textsuperscript{th} edn, 2003) at 249-258.

and choice, which was originally based on the work of Daniel Kahneman\(^6\) and Amos Tversky.\(^7\) The most important of the findings of the psychology of judgment and choice refer to the mapping of the cognitive processes - called *heuristics* - and the impact of cognitive biases on decision-making. The incorporation of the insights of psychology of judgement and choice into economic theory has shaped what is today called behavioural economics.\(^8\) In turn, scholarly attempts to incorporate the findings of BDT into legal analysis have given rise to a distinct movement within legal theory, so-called behavioral law and economics (BLE).\(^9\) BLE scholars have provided a fierce critique of Posnerian law and economics, which is largely based on assumptions of perfect rationality perceiving participants in the legal system as rational utility maximizers.\(^{10}\) Arguably,

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\(^6\) Kahneman, essentially an ‘applied psychologist’, was awarded the Nobel Prize in Economics in 2002, jointly with Vernon L. Smith. His untimely death deprived Amos Tversky from the same honour. The Swedish Academy’s Press Release is available at: http://www.nobel.se/economics/laureates/2002/index.html


because of the constantly evolving nature of BDT, some of the initial predictions and suggestions of BLE were misconceived.\textsuperscript{11}

Furthermore, the procedures and findings of laboratory tests of economic theory doctrines, originally based on research work carried out by Vernon Smith, have shaped a distinct branch of the science of economics that is called experimental economics.\textsuperscript{12} An analytical discussion of the main branches of BDT is offered in the second section of this article. Although there is much room for disagreement between the different branches of BDT, the divergence is not as extensive as previously thought, and the challenge that cognitive psychologists have mounted on rational choice is much more measured and balanced\textsuperscript{13} than originally assumed by BLE scholars. This allows BDT to retain a certain level of consistency and the present author to discuss it as a distinct intellectual movement with limited, however, internal coherence.

The nature and effect of cognitive biases affecting investors, such as loss-aversion, anchoring, the endowment effect and many others (analytically discussed in the second section of the article), have sometimes received confusing treatment in scholarly


\textsuperscript{13} ‘I carefully explain that research on heuristics and biases only refutes an unrealistic conception of rationality, which identifies it as comprehensive coherence.’ See Daniel Kahneman, ‘Autobiography’, available at \url{http://nobelprize.org/economics/laureates/2002/kahneman-autobio.html}
work. As a result, their impact on investor decision-making has not even entered the realm of serious discussion in the various regulatory fora. Some of this confusion may be attributed to the situation specific and context conscious nature of BDT. Nonetheless, a number of BDT findings are now so uncontroversial as to allow realistic policy proposals to be founded on them. Such proposals should offer effective remedies to counter the damaging results of the best documented cognitive biases. The framing effect, in particular, which refers to the way a problem is posed for the decision maker, has been documented to have a distorting impact on individuals’ decision-making. Thus, it influences individuals’ choice of investments and of investment policies. In addition, stock market bubbles are often attributed to overconfidence and investor herding. The latter may, among other reasons, be the result of professional investors’ concern to post short-term gains. Sustained herding often leads to stock market bubbles, which are, in general, damaging to both the market and investor welfare. Eventually the ‘bubble’ bursts inflicting devastating financial losses to investors, and, in the absence of fraud, there are no legal grounds allowing recovery of such losses.

The standard BLE response to the cognitive biases identified by BDT is more regulation, which is naturally of a paternalistic nature, as it aims to restrict individuals’ choice in order to counter the undesirable results of such biases. The most measured of requisite proposals have been put forward in two separate papers by Professors Thaler and Sunstein, and Camerer, Issacharoff, Lowenstein et al. Conscious of the undesirable and restrictive effects that regulation brings, these scholars have striven to devise a form of ‘light touch’ paternalistic regulation, which they respectively call libertarian
This form of regulation is meant to counter the most harmful effects of cognitive biases without affecting the choices of the more sophisticated, less ‘behaviourally challenged’ decision-makers. However, because it remains very hard and perilous to propose regulation where there is no evidence of a market failure, any suggestions of new regulation to counter investor cognitive biases must be based on concrete evidence of the debilitating impact of such biases, which the specific piece of regulation seeks to remedy.

Contemporary investor protection regulation comprises: (a) rules prohibiting market abuse (insider dealing and market manipulation) and securities fraud, which, in effect, protect the integrity of the market and the interests of public investors, (b) conduct of business rules, namely, rules that regulate the way investment intermediaries provide investment advice, asset management, and trade matching and execution services to their clients, as well as the way they conduct investment promotions, and (c) the disclosure obligations of publicly traded companies (mandatory disclosure rules). The rational investor model is closely linked with the disclosure techniques used by investor protection regulation and was first incorporated into the New Deal Statutes. It has been ever since the underlying rationale of all major legislation dealing with the workings of financial markets. Leading examples constitute the US Sarbanes Oxley Act and recent

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EU legislation regulating securities markets.\textsuperscript{18} The advent of Efficient Market Hypothesis (EMH), an intellectual child of rational choice theory, has further strengthened the rational investor model; though the reasoning of legal scholars embracing the EMH has been steadfastly hostile to very central pieces of investor protection regulation, such as the prohibition of insider dealing and mandatory disclosure regimes.\textsuperscript{19}

By placing much more importance on such issues as bounded rationality, overconfidence, professional traders’ tendency to herd when noise traders are active in the market, BDT scholars have developed views which are much closer to the actual workings of financial markets than the EMH. The contrast between the EMH assumptions and the findings of this new branch of financial economics called behavioural finance receives analytical treatment in the fourth section of the article.

In most part BDT does not make normative statements, nor does it give answers to the questions it poses. Furthermore, its assumptions are not equipped with the perfect intellectual coherence and consistency of rational choice theory. However, the fact that individuals experience cognitive boundaries and biases, such as the framing effect, is well


documented. Thus, this article suggests a number of light touch regulatory measures to counter their undesirable effects in four areas of investor protection regulation: provision of investment advice, investment promotions, mandatory disclosure, and asset management.

In most of the above fields of investment activity, professionals may not be trusted to protect investors’ interests, *inter alia*, because of conflicts of interest. In addition, current investor protection rules are, arguably, unable to provide an effective remedy to the distorting impact of cognitive biases. Therefore, an overhaul of the current regulatory framework is needed for two reasons: first, in order to enable investors to adopt the most optimal decision without placing excessive reliance on assistance provided by investment professionals, and, secondly, in order to create incentives that align the interests of investment professionals with those of investor principals.

Suggested measures comprise increased pluralism in disclosure formats and the prescribed volume of information reaching various investor classes, prescriptions of properly structured (‘edited’) investment contracts, and the mandatory use of long-term performance targets for fund managers by pension fund trustees. Although paternalistic in their nature, the above measures do not seriously restrict unsophisticated and professional investor choice of investments and of investment and trading strategies. Moreover, if adopted, they would prove of strategic importance in curtailing speculation and act as stabilizing mechanisms during periods of short-term market rises or falls. Thus, they can become the backbone of an evolutionary and realistic effort to incorporate the least controversial of the findings of BDT into investor protection regulation.
Furthermore, a number of case studies have shown that the use of experimental economics in designing effective institutions may not be underestimated due to regulators’ and policy-makers’ lack of expertise in this area. Therefore, the use of economic experiments in the *ex ante* evaluation of financial market/investor protection regulation would be a useful complement to the above proposals.

This article is divided in six sections. The first section is the present introduction. The second section provides a concise analysis of the most pertinent assumptions of the findings of the psychology of judgement and choice and of experimental economics. The third section discusses the influence of BDT on theory of regulation. The fourth section deals with the distorting impact of cognitive biases on investor behaviour. It also explains why the inconsistent nature of these biases and the ever evolving research in the relevant areas preclude any calls for wholesale regulatory reform. The fifth section provides a number of suggestions, which, based on the most uncontroversial findings of BDT, call for a light touch regulatory intervention in a limited number of areas. The sixth section brings the different straddles of the present discussion to a comprehensive conclusion.

2. The BDT Revolution

A Preferences: Prospect Theory, Mental Accounting and the Framing Effect

Experimental economics and cognitive psychology highlight, using different methodologies/perspectives, the cognitive limitations affecting individuals’ decision-making. Psychologists’ studies reveal tendencies to draw judgments and make decisions that systematically depart from the neoclassical economist's rational choice/expected utility model. However, as a full discussion of the challenges that BDT has mounted on rational choice theory is the subject of several dozens of books and hundreds of articles in
at least four distinct academic disciplines: psychology, economics, finance, and
behavioural law and economics, only a concise summary of the assumptions of BDT is
offered here focusing on its findings that are most pertinent to the regulation of
investment markets.\textsuperscript{20} The discussion starts with an analysis, in this paragraph, of the
challenge mounted by the psychology of judgement and choice, and by extension by
behavioural economics on rational choice theory. In a subsequent paragraph, I shall
discuss the cautious critique/acceptance of rational choice theory offered by experimental
economics.

Providing a complete account of the concept of rationality and of its principles is
by itself a challenging task. There is even disagreement as to whether rationality has been
conceived to be a theoretical framework that defines individual preferences or it just
explains prediction.\textsuperscript{21} Nonetheless, it is assumed here that rational choice theory
comprises the following propositions: human agents strive to maximize their utility from
a stable set of well-defined preferences accumulating, in the process, an optimal amount
of information and other inputs in a variety of contexts.\textsuperscript{22} The theory that, in the face of
uncertain outcomes, individuals will choose a decision or a course of action that
maximizes expected utility, so called, expected utility hypothesis was first clearly

\textsuperscript{20} Many of the concepts discussed here, especially those used by behavioural finance, are based
on formidable mathematical calculations. Given that the reproduction of such calculations would
add nothing to the argument advanced by this article and would, perhaps, be outside what is
expected by an article on regulatory policy published in a law review, reproduction of most of
these calculations has been eschewed.

\textsuperscript{21} For an analytical account of the difficulty to describe rationality see Sunstein, Jolls and Thaler,
above n 9 at 1488.

\textsuperscript{22} See Gary S. Becker, \textit{The Economic Approach to Human Behavior} (1976) at 14 and Posner,
above n 4 at chs. 1-3.
expressed by Daniel Bernoulli in 1738. Expected utility was further refined by Von Neumann and Morgenstern, who incorporated it into decision theory. The two leading game theorists suggested that if individuals' preferences satisfy a number of plausible axioms: completeness, transitivity, continuity, and independence, then they can be represented by the expectation of a utility function. Accordingly, the proverbial rational man of neoclassical economics (the famous ‘homo economicus’) is supposed to act to maximize expected utility, because his/her preferences are given, consistent, and representable in the form of a utility function.

Rational agents are assumed to be indifferent between receiving a given financial bundle or a gamble with the same expected value. Moreover, where individuals operate in conditions of uncertainty about the results of their actions, they are assumed to be able to assess the probability distribution in accordance with their level of knowledge. If new information can be collected from the environment, individuals know the information's possible content and can assess, in accordance with Bayes’ law, calculating the

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25 Bayes' Theorem is a mathematical formula used to calculate conditional probabilities. The probability of a random (stochastic) event A that is conditional on another random event B is generally different from the probability of random event B conditional on A. However, there is a relationship between the conditional probabilities of the two events and Bayes' theorem is the statement of this relationship. \( P(A) \) is the prior probability (or marginal probability) of \( A \). \( P(A|B) \) is the conditional probability of \( A \), given \( B \). \( P(B|A) \) is the conditional probability of \( B \) given \( A \). \( P(B) \) is the prior or marginal probability of \( B \), and acts as a normalizing constant. Therefore, under Bayes theorem, the posterior probability of an event is proportional to the prior probability times the likelihood. The significance of the theorem was first underlined by the British cleric Thomas Bayes in his posthumously published work, ‘An Essay Toward Solving a Problem in the Doctrine of Chances’ (1764) 53 Philosophical Transactions of the Royal Society of London 370, rep. (1958) 45 Biometrika 293. In some interpretations of probability, Bayes’ theorem tells how to update or revise beliefs in light of new evidence. See on the theorem, John Earman, Bayes or Bust? (1992); John A. Hartigan, Bayes Theory (1983).
probability distribution based on the interplay between the new information’s content and their prior knowledge. Namely, people make predictions about future events on the basis of existing or new information, which they readily process, using as basis to calculate the probability distribution of such events Bayes’ famous theorem.

The theory of expected utility has been criticized on many grounds.26 For instance, it is highly debatable whether individuals are fully adept at evaluating their own preferences, accurately predicting their future preferences, or even accurately assessing experienced well-being from past choices.27 The most serious challenge to the theory of expected utility has been mounted by prospect theory,28 developed by Daniel Kahneman and Amos Tversky in what was, after the discussion of heuristics, the biggest success of their long-term and fruitful academic collaboration.29

26 One ground of criticism has been the weighted-utility theory, see S. H. Chew, ‘A Generalization of the Quasilinear Mean with Applications to the Measurement of Income Inequality and Decision Theory Resolving the Allais Paradox’ (1983) 51 Econometrica 1065; another ground of criticism has been the theory of disappointment aversion, see F. Gul, ‘A Theory of Disappointment in Decision Making under Uncertainty’ (1991) 59 Econometrica 667.


28 According to Kahneman, the term was chosen in order to both be free from any prior meaning and have attention-getting attributes. See Kahneman, Autobiography, above n 13. See also D. Kahneman, ‘Maps of Bounded Rationality: A Perspective on Intuitive Judgement and Choice’, Nobel Prize Lecture, 8 December 2002. Prospect theory is presented here in a simplified form in order to make it accessible to the standard reader of a law review.

Prospect Theory is a study of how individuals manage risk and uncertainty; its original version was designed for gambles with at most two non-zero outcomes. Kahneman and Tversky suggested in their 1979 paper that, when offered a gamble where outcome $x$ has probability $p$ and outcome $y$ has probability $q$, people assign it with a value of $\pi(p)v(x) + \pi(q)v(y)$ and pick the one with the highest value. $^{30}$ This formulation leads to the conclusion that individuals measure utility over gains and losses rather than over final wealth positions. $^{31}$ Namely, unlike what is assumed by the theory of expected utility, individuals’ preferences are reference dependent; $^{32}$ therefore, the value assigned to a given state of wealth does vary with the decision maker’s initial state of wealth.

The second important finding of Prospect Theory is the shape of the value function $v$. This is concave over gains and convex over losses. As a result, it reveals a deep seated loss aversion by individuals. This bias has been repeatedly confirmed by several studies. The documented loss aversion goes beyond conventional risk aversion, since relevant studies show that people are significantly ‘loss averse’ for even small amounts of money. Tversky and Kahneman suggested in their 1991 paper that in most fields, where the sizes of losses and gains can be measured, people value moderate losses roughly twice as much as equal-sized gains. $^{33}$

$^{30}$ See Kahneman and Tversky, Prospect Theory, above n 29.


$^{32}$ Early research on economic models with reference dependent preferences had been carried by James S. Duesenberry, Income, Saving and the Theory of Consumer Behavior (1952) and A. C. Pigou in ‘Some Aspects of Welfare Economics’ (1951) 43 American Economic Review 287.

Loss aversion is closely linked to the surprising endowment effect, discussed first by Richard Thaler.\textsuperscript{34} The endowment effect reflects experimental (and empirical) evidence that the maximum amount a person would be willing to pay to acquire a good is often significantly less than the minimum amount she would be willing to accept to sell the same good. This finding contrasts with the assumptions of the rational actor model that possession does not affect value and shows that emotion plays a serious role even for transactions that should be merely subjected to a utilitarian cost-benefit analysis. Nonetheless, as explained in the fourth section of the article, it seems that the endowment effect is much less important in the context of financial markets, unlike some other cognitive biases such as loss aversion and overconfidence.

The third tenet of Prospect Theory is an illustration of nonlinear probability transformation, which, of course, violates Bayes’ law. Small probabilities are over weighted, so that \( \pi(p) > p \), in line with Kahneman and Tversky’s finding that \((5000, 0.001) > (5, 1) \) and \((-5, 1) > (-5000, 0.001) \). Moreover, people are more sensitive to differences in probabilities at higher probability levels. As a result, twenty percent (20\%) increase in probability from 0.83 to 1 is more striking to people than a twenty percent (20\%) increase from 0.3 to 0.36. Finally, people place much more weight on outcomes that are certain relative to outcomes that are merely probable.\textsuperscript{35}


An important aspect of Prospect Theory is that it can explain why people make different choices in situations with identical final wealth levels. Thus, it can accommodate the effects of problem description or framing.\textsuperscript{36} This refers to the fact that the way a problem is presented to the decision maker influences actual choice. Barberis and Thaler note that there are numerous demonstrations of a 30 to 40 percent (30\%-40\%) shift in preferences depending on the wording of a problem.\textsuperscript{37} This means that individuals’ choices can be manipulated depending on the way relevant information is presented. The effect of framing is stronger among the less sophisticated members of any group.\textsuperscript{38} However, even thoughtfulness is not sufficient to counter the effect of framing; thoughtful individuals are still in need of a relevant cue in order to untangle the impact of framing.\textsuperscript{39}

The assumption that preferences are not affected by variations of irrelevant features of options or outcomes, namely, that choices are independent of the problem description or representation, called extensionality\textsuperscript{40} or invariance,\textsuperscript{41} is an essential aspect of rational choice theory. Therefore, the fact that framing may have a powerful influence on decision-making, including the choice of investments and of investment strategies,


\textsuperscript{37} Barberis and Thaler, A Survey of Behavioral Finance, above n 35 at 20.


\textsuperscript{39} Ibid.


\textsuperscript{41} Tversky and Kahneman, Loss Aversion, above n 33.
poses an interesting and urgent problem for policy-makers. Since the controlled processes of reason cannot without the provision of relevant cues discern the effect of framing, a regulatory mechanism must be devised to counter this effect, when it is harmful to investor welfare. Thus, it is argued in subsequent sections that, in light of strong evidence as to the impact of framing on the investment (and savings) choices of unsophisticated investors, regulatory intervention is required that will provide a mandatory format for the description of risk in investment contracts/products that are offered to them. The suggested measure goes beyond what is currently provided by existing rules regulating true and fair disclosure. In addition, apart from prescribing the format, structuring such contracts/products through the use of carefully chosen welfare enhancing rules of default could be an effective way to counter the effects of limited self-control and of procrastination.

Mental accounting and narrow framing are cognitive concepts derived from prospect theory. They are very helpful to our understanding of how individuals make investment choices. The process people adopt to formulate financial problems for themselves is called mental accounting. For example, suppose that a gambler goes to

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43 On the influence of individuals’ limited self-control in negating the life-cycle model of savings see R. H. Thaler, ‘Psychology and Savings Policies’ (1994) 84 American Economic Review 186 at 187-88. e.g., people find it much easier to save from lump sum rather than regular payments.

the race track and wins £500 in her first bet, but then loses £100 on her second bet. Does she code the outcome of the second bet as a loss of £100 or as a reduction in her recently won gains of £500? Namely, is the utility of the second loss \( v(-100) \) or \( v(400) - v(500) \)? Mental accounting could be very important in the course of making financial decisions, because, according to Prospect Theory, \( v \) is nonlinear, and thus, individuals may infer the wrong conclusions from an accurate set of data.

A very important aspect of mental accounting is narrow framing, which is the tendency to treat individual gambles (or individual financial contracts risk and return) separately from other portions of a person’s wealth.\(^{45}\) In other words, when offered a gamble, people often evaluate it as if it is the only gamble they face in the world, rather than merging it with pre-existing bets to see if the new bet is a worthwhile addition.\(^{46}\)

B    Heuristics and Biases

Kahneman and Tversky’s pioneer research has demonstrated that people’s judgements originate in impressions as well as in deliberate reasoning. Namely, individuals make decisions using automatic processes (perception), cognitive processes (intuition) and controlled processes (reasoning).\(^{47}\) The processes of intuition are called *heuristics* or

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\(^{46}\) In other words, *narrow framing* means that the agent derives utility directly from the outcome of a specific gamble she is offered, and not just indirectly via its contribution to her total wealth. Similarly, she derives utility from the gamble’s outcome *over and above* what would be justified by a concern for her overall wealth risk. See Nicholas Barberis and Ming Huang, ‘Preferences with Frames: A New Utility Specification that Allows for the Framing of Risks’, preliminary draft, Yale and Stanford, August 2004, available at http://badger.som.yale.edu/faculty/ncb25/tc15b.pdf
rules of thumb. Another distinction that should be discussed is that between heuristics and biases. While heuristics are cognitive processes, biases are the results of the use of heuristics, when they lead to: (a) ‘systematic errors in estimates of known quantities and statistical facts’ and (b) systematic departures of intuitive judgments from the principles of probability theory.

Arguably, cognitive biases are the result of the evolutionary nature of human intelligence. However, there is no reason to assume that invariably the use of heuristics leads individuals to wrongful results. As Kahneman and Tversky observed in their 1974 paper that described the heuristics of representativeness, availability and anchoring:

People rely on a limited number of heuristic principles which reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations. In general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors.

The ambiguous outcome of the use of heuristics is confirmed by Kahneman, who has observed that it was his and Tversky’s fault not to stress that heuristics are as much likely to lead to errors as to accurate assessments. Research into the various functions and characteristics of heuristics is ongoing and is marked by continuous controversy and new

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47 ‘From its earliest days, the research that Tversky and I conducted was guided by the idea that intuitive judgments occupy a position — perhaps corresponding to evolutionary history — between the automatic operations of perception and the deliberate operations of reasoning.’ See Kahneman, A Perspective on Intuitive Judgment, Nobel Prize Lecture, above n 29 at 450.


49 See Kahneman and Tversky, above n 48 at 1124.

50 See Kahneman, above n 13.
discoveries. As a result, the relevant literature is vast and growing. I discuss here only those heuristics that are most pertinent to the present analysis.

Kahneman and Tversky have shown that, when people try to determine the probability that a data set A was generated by a model B, or that an object A belongs to a class B, they often use the representativeness heuristic. This means that individuals evaluate probability by the degree to which A reflects the essential characteristics of B. Much of the time, representativeness is a helpful heuristic, but it can generate some severe biases. It may also lead to sample size neglect. This term is used to describe the common phenomenon, where, in judging the likelihood that a data set was generated by a particular model, people do not take into account the size of the sample, namely they assume that a small sample can be just as representative as a large one. This bias was called by Kahneman and Tversky the law of small numbers.

The availability heuristic controls estimates of the frequency or probability of events, which are judged by the ease with which instances of such events come to mind. In other words, the availability heuristic is an assessment of accessibility. As Daniel

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53 e.g., one may assume that six tosses of a coin resulting in three heads and three tails is as representative of a fair coin as 500 heads and 500 tails are in a total of 1000 tosses. Another illustration of the law of small numbers is the “gamblers fallacy”, i.e. the mistaken (and irresistible) belief that a roulette wheel that has come up red several times in a row is “due” for a black outcome’. See Kahneman, Autobiography, above n 13.

Kahneman observed, the availability heuristic may lead to errors as often as to accurate responses.\textsuperscript{55} Another heuristic studied systematically by the psychology of judgement and choice is anchoring. In forming estimates, people often start with some initial, possibly arbitrary value, and then adjust away from it. In other words, anchoring refers to the process by which an individual decision maker gravitates to a reference point that she subsequently uses as an initial condition for arriving at a final decision. Experimental evidence shows that people anchor too much on the initial value, \textit{e.g.} on prevailing current interest rates or stock prices, and subsequent adjustment is often insufficient.

\section{Behavioural Economics}

The idea that decision makers evaluate outcomes by the utility of final asset positions has been the orthodox approach in economic analysis for almost 300 years. Thus, Kahneman and Tversky’s suggestion that Bernoulli’s model was flawed heralded a major revolution in economic analysis. The same was the effect of psychologists’ research on \textit{heuristics}, the use of which may lead to outcomes exhibiting systematic departures from the predictions of the rational choice model. In order to bridge these gaps, behavioural economists such as Richard Thaler, Colin Camerer, George Loewenstein, Matthew Rabin and others have striven in the past twenty-five years to integrate insights from psychological research into economic analysis. Their efforts have reversed the century old separation of economics from psychology.

Accordingly, behavioural economics studies the importance of \textit{heuristics} and \textit{biases} in microeconomic and macroeconomic contexts. The founding text of behavioural

\textsuperscript{55} See Kahneman and Tversky, above n 48.
economics was an article by Richard Thaler in 1980, which presented a series of vignettes that challenged fundamental aspects of consumer theory. Subsequently, joint research by Kahneman, Thaler and Knetsch revealed the role of entitlements (the endowment effect) and of the rules of fairness. Behavioural economics gained further respectability by some important discoveries Thaler made in the series of ‘Anomalies’ columns that he published in every issue of the *Journal of Economic Perspectives* from 1987 to 1990, and has continued to write occasionally ever since.

Many of Thaler’s discoveries referred to financial market ‘anomalies’, namely, observed investor behaviour and other market phenomena in this field that did not fit the EMH model. Research concerning those ‘anomalies’ (also called ‘puzzles’) shaped what is now called behavioural finance. Because most of the problems (‘puzzles’) that concern behavioural finance are particularly pertinent to investor protection regulation, the main theoretical propositions of behavioural finance and the findings of requisite empirical studies shall be discussed in the fourth section of the article.

What should be noted here is that, inspite of its interesting assumptions and fascinating findings, behavioural economics does not constitute an all encompassing theory of economic behaviour/activity. First, cognitive psychology has not produced a unitary theory that explains or predicts the full range of human behaviour; in fact,

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56 See Thaler, A Positive Theory of Consumer Choice, above n 34.


58 See Korobkin and Ulen, Law and Behavioral Science, above n 9 at 1071-1075.
Kahneman and Tversky made no normative suggestions in their research.\textsuperscript{59} Secondly, the findings of continuous research in the field of neuroscience have not yet been incorporated into economic analysis, although, recently, proponents of behavioural economics have declared their readiness to gradually integrate the findings of other cognitive sciences into economic theory.\textsuperscript{60} It is possible that the advances made by neuroscience, which employs such techniques as brain imaging and psychophysical tests in the reading and mapping the contours of human brain, may greatly influence the analysis of human economic behaviour and even discard some of the current assumptions of behavioural economics.

\section*{D Experimental Economics and Rational Choice Theory}

According to its intellectual father Vernon Smith, experimental economics applies laboratory methods of inquiry to the study of motivated human interactive decision behaviour in social contexts, which are governed by explicit or implicit rules.\textsuperscript{61} Thus,

\footnotesize
\begin{itemize}
\item \textsuperscript{59} See Kahneman’s Nobel Lecture, above n 29.
\end{itemize}

\normalsize
experimental economics shares with behavioural economics the use of experiments to test the propositions of economic theory. Yet their findings differ in some respects.

Experimental economics reflects equally the rational and behavioural intellectual traditions. Its main findings do not discard rational choice theory; they merely challenge the idealistic foundations of neo-classical economics that people exhibit unbounded rationality, pure self-interest, and complete self-control when making economic decisions. Experimental economics shows that in reality human activity is diffused and dominated by unconscious, autonomic, neuropsychological systems. These enable people to function effectively without always calling upon the brain's scarcest resource: attentional circuitry. Namely, experimental economics is concerned with the ecological concept of rationality which asks questions as to why a specific social practice, or a specific game, has been chosen instead of another. It challenges SSSM based theories and thought processes about social systems, which exclusively involve the conscious and deliberate use of reason. Experimental economics is placing particular importance on the operation of markets under the limitations of bounded rationality. However, while experimental testing of rational predictive models of decision-making in economics has been conducted for at least fifty years, the results of the relevant tests ‘are decidedly mixed’.

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63 Smith, Economics in the Laboratory, above n 61.

Experimental economics underscores the importance of other-regarding preferences (preferences that are not solely motivated by self-interest), in addition to own-regarding ones, which consider only how the decision’s outcome will affect the chooser’s non material payoff, and of learning. By stressing and evidencing the importance of other-regarding preferences in individuals’ decision-making, experimental economics takes issue with the second foundation of the model of the rational economic actor: self-interest. Relevant experiments show that individuals are ready to sacrifice self-interest in a variety of non-market contexts in order to co-operate or to pursue the societal values of fairness, altruism, and distributional justice. On the other hand, in assuming that individuals are capable of learning in market contexts, experimental economics reaches the conclusion that rational behaviour may emerge over time by trial-and-error adaptation processes as a result of repetitive market activity. Thus, it strengthens the predictions of the first foundation of the rational model: rationality.

The most pertinent to the present discussion from the findings of experimental economics is that, in competitive markets, institutions (the rules of the game) matter,

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67 Vernon Smith notes the ‘tendency for rational behavior to emerge in the context of a repetitive market institution’, Smith, Economics in the Laboratory, above n 61 at 118.
because they determine information and private incentives. But the incentives to which people respond are sometimes not those one would expect based on the canons of economic theory. For instance, it is very doubtful whether financial incentives could act as generalized substitutes to prescriptive regulation, since their impact on cognitive performance is still largely unknown and relevant studies have reached contradictory conclusions.

Smith's pioneering work has elevated experimental economics to an essential tool in analysing and designing economic institutions and systems. Smith suggests that in a market among professionals, trading systems operating a continuous double auction are more adept at maximizing traders’ gains, because they present narrower bid offer spreads, namely prices tend to converge faster to competitive equilibria than in systems with posted offers. Experimental work has, inter alia, led to the establishment of the Arizona Stock Exchange (commonly known as AZX), one of the most successful and innovative electronic markets for the trading of securities in the US. Furthermore, the findings of experimental economics have led to the creation of markets where none existed before such as the wholesale markets for electricity.

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69 For a summary of relevant studies and of the uncertain role of financial incentives see Mitchell, Why Law and Economics' Perfect Rationality Should not be Traded, above n 11 at 32-34.

70 Smith, Economics in the Laboratory, above n. 61.


At first reading, the assumptions underlying the psychology of judgement and choice and experimental economics seem to stand poles apart. Yet, a more careful studying and interpretation of their respective findings shows that the divergence is much narrower. As Kahneman has noted, heuristics is not a theory of irrationality, but a theory that is mapping cognitive mechanisms the employment of which in decision-making may or may not result in a departure from rational choice outcomes. Furthermore, both the psychology of judgement and choice and experimental economics agree that rational choice theory is incomplete, particularly in articulating convergence processes in time and in ignoring decision costs. Therefore, the only strong divergence between the psychology of judgement and choice and experimental economics is observed when considering whether systematic departures from rational decision-making could be observed even in market contexts, since experimental economics holds that rational choice theory provides an accurate first approximation in predicting motivated behaviour in market contexts.

3. BDT and the Law: Is Paternalistic Regulation the Right Response?

A BDT and Paternalistic Regulation

The use of BDT in the analysis of legal systems is viewed with much skepticism and has created deep divisions, especially among law and economics scholars. Relevant responses


range from full or critical endorsement, as is respectively the case with so called BLE\textsuperscript{74} and law and psychology\textsuperscript{75} scholars, to reasoned\textsuperscript{76} or doctrinal rejection.\textsuperscript{77}

Much of the bitterness of these divisions stems from the fact that the standard BLE response to the findings of BDT involves calls for more paternalistic regulation to help individuals (and to some extent organisations) to overcome the detrimental impact of cognitive biases.\textsuperscript{78} A partial explanation of calls for more regulation is that early BLE exaggerated the normative implications of the psychology of judgement and choice.\textsuperscript{79} As Professor Rachlinski notes, the psychology of judgment and choice does not support abandoning individual judgment in every instance in which people rely on a misleading heuristic.\textsuperscript{80} People can always learn better decision making strategies or delegate their


\textsuperscript{75} See Rachlinski, above n 5.


\textsuperscript{79} ‘[T]he problem is that behavioral law and economics "proceeds on the basis of inaccurate understandings of judgment and choice." Whereas law and economics assumes too much rationality on the part of legal actors as an empirical matter, behavioral law and economics errs by assuming too much irrationality.‘ Mitchell, Why Law and Economics' Perfect Rationality Should Not Be Traded, above n 11 at 70 (note omitted).

choices to those who have. Therefore, mere evidence of cognitive biases may not ‘support implementing a constraint on individual choice.’ In addition, BLE scholars have largely ignored the findings of experimental economics, which suggest that unconscious and cognitive limitations such as *bounded rationality* may, in fact, lead to optimally maximized outcomes. Namely, the absence of an infinite ability to store and process information, or provide full information may not result in any welfare losses in certain market contexts.

However, the excesses of early behavioural law and economics have to a large extent been redressed through a much more moderate approach to consumer regulation and the normative meaning of BDT in recent literature. This partial adjustment means that the remedies suggested by BLE scholars to bounded rationality and individuals’ cognitive biases may no longer be ignored as extreme, provided that the remedy does not supplant individual choice.

Professors Thaler and Sunstein have proposed an alternative form of paternalism, called *Libertarian Paternalism*. Their paper suggested that the detrimental effects of cognitive biases provide sufficient justification for the imposition of soft regulation, such as ‘default rules’, in defined contexts, where a strategic choice of default options could maximize social welfare. A similar approach to regulation has been adopted by other leading behavioural economists in the US. In a relevant article, Professors Camerer,

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81 Ibid.


83 See Thaler and Sunstein, above n 14.
Issacharoff, Lowenstein, *et al.* suggested that regulatory responses to cognitive biases should target the ‘behaviourally challenged’ without restricting considerably choice or affecting the decisions of rational actors. They call their approach to regulation: *Asymmetric Paternalism*, noting that ‘regulation is asymmetrically paternalistic, if it creates large benefits for those who make errors, while imposing little or no harm on those who are fully rational’. The regulatory measures recommended in the article, as an effective means to counter well documented cognitive biases exhibited by individuals in the course of their decision-making relating to investments, broadly conform to the above version of paternalistic regulation, also called *soft paternalism*.

B The Perils of Soft Paternalism

While the approach of libertarian/asymmetric paternalism in identifying proper remedies to counter the detrimental impact of cognitive biases on individuals has strong merits in specific contexts, on a more general level, BDT draws no normative assumptions that support the introduction of stricter and more inclusive regulation, even in the form of soft paternalism. On the contrary, to some extent the findings of BDT seem to favour free competitive markets over formal regulation. This view is not only supported by the

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83 See Camerer, Issacharoff, Lowenstein *et al.*, above n 15.

84 See E. L. Glaeser, ‘Paternalism and Psychology’ (2006) 73 *Univ Chi L Rev* 133. However, emerging neuroscience research seems to favour paternalism. See C. Camerer, ‘Wanting, Liking, and Learning: Neuroscience and Paternalism’ (2006) 73 *Univ Chi L Rev* 87. As three separable neural systems seem to be responsible for choice and welfare: ‘a hedonic “liking system” (welfare), a “wanting” system that guides choice, and a learning system that, ideally, links information stored in other systems so that people choose to learn what they truly like’ according to Camerer, paternalistic rules might have a role in equating wanting and liking. Id at 87, 109-110.

findings of experimental economics in respect of individuals’ capacity to learn from costly errors, but also by the psychology of judgement and choice.

First, the agents (politicians and regulators), who are called to implement protective legislation, are subject to cognitive biases themselves and nothing can ensure that the rules they will draft and the way they will enforce them will be free from the influence of such biases. Secondly, the principals (individual voters), who will be called to legitimize such measures, may be challenged more strongly by the effects of such biases when they take decisions in the sphere of political rather than in the sphere of economic life. At the very least, within the former the effect of biases will be more common and persistent. It seems that to individual voters ‘the cost of a mistake in choosing a candidate is trivial because he is unlikely to affect the result of any election.’ Whereas, individuals seem to bear directly some of the cost of economic mistakes they make as a result of cognitive biases.87

Secondly, as Edward Glaeser, a Harvard economist, has argued, even soft paternalism presents serious shortcomings, including, inter alia, the following: (a) ‘it can cause bad decisions just as easily as hard paternalism’, (b) it can lead to abuses more often than hard paternalism, because it is more attractive, allowing the building of wider public support, (c) it ‘can build dislike or even hatred of subgroups of the population’, (d) it can lead to hard paternalism, and (e) it complements government persuasion reinforcing the powers of the state bureaucracy.88 Glaeser’s arguments do present special


88 See Glaeser, Paternalism and Psychology, above n 85 at 149-156.
merits, but a generalized discussion of them is outside of the ambit of this article. However, the regulatory measures suggested in section five to counter the effect of specific cognitive biases in the context of investment markets have taken fully into account Glaeser’s arguments. Thus, they are very focused and low scale, necessitating minimal involvement by regulatory bureaucracies, once the suggested regulatory framework is in place. They are also designed to be attached to an existing system of public monitoring, minimizing implementation costs to regulated firms and eliminating the scope for abuse and discrimination.

4. **Behavioural Finance and Investor Protection Regulation**

A  **Principles of Behavioural Finance**

As mentioned above, behavioural economics does not constitute an all encompassing theory of economic behaviour/activity. Instead, it offers a ‘pragmatic’ collection of what seem to be ‘situation- specific mini-theories’.\(^{89}\) This has not prevented behavioural finance scholars from offering convincing answers to a number of questions (‘puzzles’) concerning the behaviour of financial markets that may not be explained by the rational choice model. In contrast to the EMH perspective, behavioural finance attributes many of these ‘puzzles’ to investor cognitive biases. Thus, an analysis that contrasts the main assumptions of EMH and of behavioural finance is necessary. It also provides, assuming that the findings of behavioural finance are endorsed, a good exposition of the distortive impact of cognitive biases on individuals’ investment decisions.

The fundamental assumption of rational choice theory about financial markets is that markets move only on the basis of rational expectations. Namely, asset prices are set by rational investors.\(^{90}\) EMH, as the brainchild of rational choice theory,\(^ {91}\) assumes that market prices reflect (equal) fundamental value and change on the basis of new information. Thus, in an efficient market no investment strategy can yield average returns higher than the risk assumed (‘there is no free lunch’) and no trader can consistently outperform the market or accurately predict future price levels, as new information is instantly absorbed by market prices.\(^ {92}\) Another EMH assumption is that markets are efficient and transaction costs relatively low, giving ‘professionally-informed traders’ the opportunity to quickly observe and exploit through arbitrage trading any price deviations from fundamental value, as this would create an opportunity to profit from such discrepancy. The result of arbitrage activity is that prices reach a new equilibrium, which reflects more accurately the traded asset’s value and corrects any mis-pricings.\(^ {93}\)


Behavioural finance challenges most of the assumptions of EMH.\textsuperscript{94} The main tenets of behavioural finance are that\textsuperscript{95}: (a) certain market phenomena called ‘anomalies’ or ‘puzzles’ cannot be explained by the EMH, whereas the use of psychology can provide convincing explanations and (b) the corrective influence of arbitrage trading is limited due to a number of restrictions.

Starting from the second point, convincing evidence has been offered indicating that arbitrage trading may not have the strong corrective role ascribed to it by EMH scholars, because, it is not a cost-free but a risky activity.\textsuperscript{96} If we assume two kinds of investors in the market: (a) rational speculators or arbitrageurs who trade on the basis of information and (b) quasi-rational investors,\textsuperscript{97} called noise traders,\textsuperscript{98} then it follows that a number of investors act on imperfect information.\textsuperscript{99} Thus, they cause prices to deviate from their equilibrium values.\textsuperscript{100} However, as EMH proponents accurately counter, the


\textsuperscript{98} The issue of ‘noise’ and its impact on the markets was first analytically discussed by the late Fischer Black. See F. Black, ‘Noise’ (1986) 41 Journal of Finance 529.


\textsuperscript{100} Surprisingly recent research has found that noise traders, on certain occasions, outperform even better informed traders’ abnormal returns, though such out-performance is infrequent. See
actions of noise traders alone are ‘insufficient to result in inefficient market prices’. Any price inefficiencies created by noise trading will be exploited by arbitrageurs (so-called ‘smart money’). Three additional elements are required: (a) the biases exhibited by noise traders must be consistent;\(^\text{101}\) if they are not, most economists would agree that, in a world of heterogeneous biases as much as beliefs, some individuals’ biases will cancel out those of others;\(^\text{102}\) (b) the effect of such biases must be so strong as to ‘blind’ arbitrage traders to the obvious profit opportunities because of prevalent ‘price inaccuracies’; for instance, hedge funds not only have available to invest very large pools of funds, but also they search on a continuous basis for profit opportunities on a global scale; (c) arbitrage is limited by other financial or regulatory restrictions.

As regards the first argument, sometimes, ‘a single bias extends across most noise traders’, and thus not only there is no cancelling out of different biases, but also the impact of a single bias, e.g., overconfidence, is exacerbated leading to a price spike or a ‘bubble’.\(^\text{103}\) It is accurately argued that a ‘sharp increase in the participation of individual investors’ in trading activity that moves prices toward one direction, as is the case with stock market bubbles, ‘is a powerful indication that they share a common bias’\(^\text{104}\)

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\(^{101}\) See Gilson and Kraakman, Twenty Years Later, above n 93 at 725, 733.

\(^{102}\) Ibid.


\(^{104}\) Gilson & Kraakman, Twenty Years Later, above n. 93 at 733.
Secondly, the agency relationship that governs the actions of fund managers and other professional investors (so-called ‘separation of brains from capital’)\textsuperscript{105} often places limits to arbitrage. Career concerns closely linked to the need to show short-term profits that are at least comparable with those of competitors force fund managers to herd. As a result, they forego arbitrage opportunities. Namely, noise traders force professional investors to herd in order to post short-term gains.\textsuperscript{106} The motives causing institutional investor herding are analytically discussed in section five.

Thirdly, arbitrage is often subject to regulatory restrictions on short-sales, considerable transaction costs (e.g., high costs in stock-lending). Considering the corrective influence on the market of short sales,\textsuperscript{107} regulatory and transaction cost restrictions sharply reduce their volume and thus their effectiveness.

The so-called Royal Dutch Shell and Closed-End Funds puzzles constitute strong evidence of the limited impact of arbitrage, due to noise trading. In addition, a number of other market ‘puzzles’ discussed below provide a clear exposition of the contrasting approaches of EMH and behavioural finance.

(i) Royal Dutch Shell

The pricing of the shares of the Royal Dutch/Shell Group has been one of the first market phenomena used by behavioural finance scholars to show the limitations of the

\textsuperscript{105} Shleifer and Vishny, Limits of Arbitrage, above n 96.


EMH. Royal Dutch Shell is the result of the 1907 merger of Royal Dutch Petroleum and Shell Transport, which were independently incorporated in, respectively, the Netherlands and England. The merger of the two companies’ assets was agreed on a 60-40 basis. Roughly this ratio remained the basis for the division of cash flows between the two segments of Royal Dutch Shell until 2005. The legacy companies maintained separate listings and Royal Dutch traded primarily in the United States (where it was part of the S&P 500 Index) and the Netherlands, and Shell has traded primarily in London, where it has been a major constituent of the Financial Times Stock Exchange Index (FTSE 100). According to the EMH model, the shares of the two components of this company should have traded at a 60–40 ratio, following exchange rate adjustments. Yet, the history of the price movement of the stocks shows a consistent deviation of over thirty five percent (35%) from the expected ratio. Even when explanations, such as taxes and transaction costs are taken into account, this very wide disparity cannot be explained but by reference to noise trading, clearly illustrating the limits of arbitrage.

(ii) Closed-end funds

Arguments concerning the inability of arbitrage to correct pricing inaccuracies, in the presence of noise trader activity, are lent additional force by the widely observed mis-pricing of the shares/units of closed-end funds. Unlike open-end funds, closed-end funds issue a fixed number of shares/units. Thus, the rational way to find a price for their shares is to divide the net value of the fund’s total assets (NAV) by the number of shares

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outstanding. Yet the average closed-end fund seems to trade at ten percent (10%)
discount or premium over NAV. Lee, Shleifer, and Thaler in their 1991 paper
suggested that some of the individual investors who are the primary owners of closed-end
funds are noise traders, exhibiting irrational swings in their expectations about future
fund returns. Sometimes they are too optimistic, while, at other times, they are too
pessimistic. Sentiment changes affect fund share prices explaining thus the difference
between share prices and NAV. This view has been received with serious skepticism by
EMH scholars, who have offered a number of rational choice explanations to this puzzle.
These include arguments about the impact of transaction costs (redemption expenses),
effects on future fund manager performance (agency costs), and tax liabilities.

While, these arguments may explain why funds usually sell at discount, they do
not say why sometimes funds sell at substantial premia or why discounts tend to vary on
a weekly basis. Furthermore, the noise trader argument provides a powerful
explanation of why it is possible to sell new closed-end funds at a premium encouraging
the establishment of closed-end funds at times of investor exuberance and why when a
closed-end fund is liquidated the share price converges towards NAV. In the latter case,
investors no longer have to worry about shifts in noise trader sentiment and they cease
demanding discounted prices over NAV to compensate for this risk.

109 Barberis and Thaler, A Survey of Behavioral Finance, above n 35 at 41.

110 M. C. C. Lee, A. Shleifer, and R. H. Thaler, ‘Investor Sentiment and the Closed-end Fund
Puzzle’ (1991) 46 Journal of Finance 75; N. Chopra, M.C. Lee, A. Shleifer, and R. Thaler,
‘Yes, Discounts on Closed-end Funds Are a Sentiment Index’ (1993) 48 Journal of Finance
801.

111 See Barberis and Thaler, A Survey of Behavioral finance, above n 35 at 41.

112 In fact, Lee, Shleifer and Thaler found that there is a strong co-movement in the prices of
closed-end funds, which is a powerful indication that noise trader risk is systematic. See n. 110
(iii) Equity premium

Another market phenomenon that has not been adequately explained by EMH scholars is the equity premium puzzle. This is the premium that US equities belonging to the S&P index have enjoyed over risk-free Treasury Bills in the past seven decades and was first discussed by Mehra and Prescott in 1985.\(^{113}\) Thaler and Benartzi have offered a purely behavioural explanation to this ‘puzzle’\(^{114}\). They have suggested that this is attributable to prospect theory related loss aversion, which, in this case, is ‘myopic’, since even investors with long-term horizons appear to be pre-occupied with short-term gains and losses. Subsequent papers have speculated that the premium may be owed to a combination of loss-aversion and another prospect theory concept: narrow framing.\(^{115}\) Namely, ‘even if investors have many forms of wealth, both financial and non-financial, they still get utility from changes in the value of the specific component of their wealth

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made up by their financial holdings. As a result, they overvalue the disutility (regret) derived from realizing a loss over a specific asset. Therefore, individuals’ susceptibility to loss aversion and narrow framing delay the disposal of losing shares for as long as possible creating the equity premium.

(iv) Volatility

Robert Shiller, a Yale economist, first showed that aggregate stock prices appear to move much more than can be justified by changes in intrinsic value, as measured by the present discounted value of future dividends. Another study by LeRoy and Porter used a similar analysis for the bond market. These studies revealed significant volatility in both the stock and bond markets. Shiller attributed fluctuations in actual prices greater than those implied by changes in the fundamental variables as being the result of fads or waves of optimistic or pessimistic market sentiment. Despite the controversy created by Shiller’s article, subsequent research seems to confirm most of his initial assumptions. In this respect, the behavioural explanation offered for the volatility puzzle is as follows:

(a) investors believe, due to the influence of the representativeness (especially of the law

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116 See Barberis and Thaler, A Survey of Behavioral Finance, above n 35 at 25.


of small numbers),\(^{121}\) that the mean dividend growth rate is more variable than it actually is; they are also overconfident about the value of their private information\(^{122}\) and (b) investor preferences, especially the degree of loss aversion, differs on the basis of prior gains and losses. Thus, in the event of good prior gains, investors become less risk averse.\(^{123}\)

(v) \(\text{Volume}\)

Another market puzzle is the level of trading volume in stock markets, which is much higher than the rationality framework would predict.\(^ {124}\) Studies on the returns of frequent traders show that these consistently under-perform the standard benchmarks (\(i.e.,\) the various stock-market indexes) and thus it would make more sense to trade less.\(^ {125}\) The explanation offered by behavioural finance scholars for this phenomenon is that investors are prone to feel overconfident.\(^ {126}\) In fact, relevant studies have found that men are more likely to feel overconfident and trade more frequently, posting, on average, lower returns than women, who are more patient traders.\(^ {127}\)

(vi) \(\text{Dividend Policy}\)

\(^{121}\)See Barberis and Thaler, A Survey of Behavioral Finance, above n 35 at 29.

\(^{122}\) Ibid. at 28-30.

\(^{123}\) Ibid. at 30-31.

\(^{124}\) Ibid. at 45-47.


While leading economists have shown that, in an efficient market with no taxes, dividend policy is irrelevant,\textsuperscript{128} actually companies keep distributing cash dividends. Even worse, they do so while they could make their taxpaying shareholders better off by repurchasing shares instead, since dividend gains have historically been taxed at a higher rate.\textsuperscript{129} The behavioural explanations offered for this ‘anomaly’ are mainly based on the work of Shefrin and Statman.\textsuperscript{130} Their explanation focuses on: (a) the role dividends can play in facilitating individuals’ self-control, \textit{e.g.}, ‘consume the dividend, but don't touch the portfolio capital’, (b) the prospect theory concept of mental accounting: ‘by designating an explicit dividend payment, firms make it easier for investors to segregate gains from losses and hence to increase their utility,’ and (c) regret, \textit{i.e.}, people’s tendency to feel stronger regret for actions of commission rather than actions of omission. Thus, by paying dividend firms help investors avoid to regret the sale of a stock, which has subsequently appreciated, in order to finance consumption. Their consumption needs can be financed by the dividend payment enabling them to retain the stock.

It has become clear from the above discussion that the main contribution of behavioural finance is that it shifts attention from the analysis of the relationship between prices and information (one of the cornerstones of modern finance theory) to investor behaviour using the insights of the psychology of judgement and choice about

\textsuperscript{128} This argument is the second part of the famous Modigliani-Miller theorem. See F. Modigliani and M. Miller, ‘The Cost of Capital, Corporation Finance and the Theory of Investment’ (1958) 48 \textit{American Economic Review} 655.

\textsuperscript{129} See Barberis and Thaler, A Survey of Behavioral Finance, above n 35 at 50. For an analytical discussion of the answers offered to this puzzle by the behavioral finance literature, id. at 49-52.

individuals’ departures from rational decision-making. Thus, the search for new information and the concept of ‘fundamental value’ become matters of secondary importance. Very large market changes and excessive volatility are attributed to ‘irrational’ investors who overreact to a given flow of information.

Although the prevailing perception of behavioural finance is that it has brought a controversial revolution to our understanding of the operation of financial markets and of individuals’ choice of investments and investment policies, a detached observer only sees the inevitable evolutionary change that all social sciences undergo, as our knowledge about the way people make decisions and the human brain functions advances. Richard Thaler, the father of the movement, has already and very plausibly predicted the ‘end’ of behavioural finance, in the sense that, at least, the best documented from its findings will soon be integrated into mainstream finance theory.

B Institutional Investor Herding and Stock Market Bubbles

Arguably, ‘bubbles’ constitute one of the market phenomena the occurrence of which shakes to its foundations the view that markets move in a rational way. In addition, they are a very potent enemy of both market efficiency and investor welfare. As

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133 See Thaler, above n 97 at 16.

mentioned above, when the ‘bubble’ eventually bursts investor losses are often devastating and, in the absence of fraud, not recoverable.

Stock market bubbles are often attributed to investors’ ‘irrational exuberance’, ‘speculative mania’ or ‘mob psychology’,\(^{135}\) which are regarded as a form of ‘mass hysteria’ that constitutes ‘an occasional deviation from rational behaviour’.\(^{136}\) A characteristic example constitutes an anecdotal quote by a London banker used to justify his participation in the third subscription to the highly overvalued South Sea Company stock in 1720: ‘When the rest of the world are mad, we must imitate them in some measure’.\(^{137}\) This statement could also describe the speculative ‘frenzy’ that occupied most quarters of global stock markets during the stock market bubble of the nineteen nineties, which mostly revolved around the stock of new technology (dotcom) companies. While Enron, WorldCom and the other companies involved in the US corporate scandals had inflated profits with fraudulent means,\(^{138}\) dotcom companies never claimed such a thing. Investors seemed to believe that technological innovation and a rapidly growing market would allow companies that would enter first the relevant

\(^{135}\) Perhaps the best description of how investor ‘mania’ leads to the creation of a ‘bubble’ was offered by an anonymous observer of the investment frenzy created by the South Sea Bubble: ‘The additional rise of this stock above the true capital will be only imaginary; one added to one, by any stretch of vulgar arithmetic will never make three and a half; consequently all fictitious value must be a loss to some persons or other, first or last. The only way to prevent it to oneself must be to sell out betimes, and so let the Devil take the hindmost.’


industries to produce strong future profits despite ever accumulating present losses.\textsuperscript{139} This belief seems to the rational observer unsustainable, yet it acquired such a strong grip on investor views as to lead to the creation of the ‘bubble’ of the nineteen nineties, in the course of which the market price of new technology companies with very few assets and mountains of debt reached stratospheric levels.

Convincing explanations about stock market bubbles may be derived from the psychology of judgment and choice, especially when considering the operation of the availability heuristic and the impact of the cognitive biases such as overconfidence.\textsuperscript{140} As mentioned above, behavioural economics has shown that individuals exhibit a deep-seated bias toward optimism in predicting future events.\textsuperscript{141} It is also a trait that the use of Internet trading has exacerbated among individual investors.\textsuperscript{142} In a rising stock market individuals embrace unsustainable beliefs that the price rises will continue indefinitely.\textsuperscript{143} Institutional investors seem also susceptible to overconfidence. Accordingly, as the market soared in the mid-nineteen nineties, investors came to assume that this pattern would continue indefinitely and kept buying overvalued stocks.\textsuperscript{144}

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\textsuperscript{143} See Shiller, n 140 above.

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The above do not mean that ‘bubbles’ have no rational explanations. A very convincing one is that herding which leads to the creation of ‘bubbles’ is investors’ reasonable response to bounded rationality and information asymmetries. Individuals conscious of the limitations of information they possess will try, under conditions of complexity and uncertainty, either to use heuristic rules; or, if they resort to the controlled processes of reason, they will try to observe the actions of persons, which are presumed to be better informed and if possible to free-ride on the investment decisions of such persons. In other words, they will follow those who appear to be informed traders.

Yet, institutional investors’ role in the creation of stock market bubbles might be better explained by behavioural analysis. Institutional investors’ money, including hedge funds, is today managed by expert individuals, who allocate, as agents, the money of their principals: the fund’s investors. Their interests, as in most principal-agent relationships, are not perfectly aligned and sometimes diverge considerably. Fund managers must show that their performance is equal or better than the rest of the market. Performance affects bonus payments and the managers’ tenure in the job. Accordingly, as individuals who

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145 See Bainbridge, above n 89 at 1038.


act for ‘arbitrageurs’, like all other investors, are in the market in order to make money and save their jobs and not in order to ‘correct’ prices, they are very likely to herd.\textsuperscript{149}

This might seem like a ‘rational’ response to noise trader activity. Professional investors follow the herd and its trading choices playing the ‘momentum game’\textsuperscript{150} in the hope that they will be able to sell and materialize their gains, before noise traders decide to sell. Namely, fund managers concentrate on trades that enable them, if not to beat the market, at least not to lag behind it saving their jobs. However, as their reaction prolongs and deepens an eventual asset bubble,\textsuperscript{151} the short-term and non-contrarian nature of their behaviour goes counter to game theory (strong) view of rationality.\textsuperscript{152} The rationale of reputational pay-offs is a very powerful explanation as to why ‘smart money’ follow the herd and inflate ‘bubbles’ instead of taking the long term view trying to ‘prick’ them. As a result, it further undermines the belief that hyper-rational arbitrageurs are always standing ready to correct any price to value discrepancies.\textsuperscript{153}

However, apart from restrictions on short-sales or trading on credit, which might as well harm market efficiency, no other direct limitation could be placed by law on


\textsuperscript{153} See Bainbridge, above n 89 at 1038.
institutional investor trading that would not unnecessarily restrict investor choice and
provoke a furore in the ranks of the world’s mightiest financial institutions. Therefore,
any regulatory intervention has to indirectly engineer a shift of fund managers’ focus
away from short-term gains without dictating trading policies. I set out such a proposal in
section five.

C  Bounded Rationality and Mandatory Disclosure

Mandatory disclosure is a system of legal and regulatory rules that compels companies
which issue securities to the public to disclose in very lengthy documents vast amounts of
information on an *ad hoc* (when they go public or seek to obtain a stock exchange listing)
or a periodic basis (once they have gone public). These documents, called either
prospectuses or disclosure forms, present issuer related information in a prescribed mode
both in terms of forms and content. The underlying rationale of mandatory disclosure
regimes is that appropriately informed investors make rational use of available
information to adopt investment decisions that enable them to maximize profit and
protect themselves against market abuse or fraud.\(^{154}\) As mentioned earlier, this rationale
has been one of the fundamental premises of the modern system of securities regulation
from the US New Deal Statutes to the Market Abuse Directive, the EC Prospectus and
Transparency Directives\(^{155}\) and the Commission Regulation on Accounting Standards.\(^{156}\)

\(^{154}\) J. Seligman, ‘The Historical Need for a Mandatory Corporate Disclosure System’ (1983) 9
*Journal of Corporate Law* 1 and J. Coffee, ‘Market Failure and the Economic Case for a

\(^{155}\) See above n 18.

\(^{156}\) Regulation (EC) 1606/2002 of 19 July 2002 on the application of international accounting
However, the actual welfare effect of the heavy volume of information that reaches the markets through mandatory disclosure rules has been questioned on many grounds.\textsuperscript{157} The most recent criticism is based on the findings of BDT.

The notion that the sound operation of financial markets is ensured through the disclosure of a heavy volume of information by issuers of investments does not sit well with investor \textit{bounded rationality}. Individuals have limited ability to process information, since they possess ‘limited computational skills and seriously flawed memories’.\textsuperscript{158} \textit{Bounded rationality} was first discussed as a potential determining factor in the making of economic decisions by Herbert Simon,\textsuperscript{159} the 1978 Nobel Prize in economics. Another question placed by BDT in this context is whether a fully informed investor is a better investor.\textsuperscript{160} Experimental research suggests that ‘complete information, far from improving market competition, tends to make it worse, and the better informed bargainer may be at a disadvantage ‘over an adversary that knows only his own pay off’, being


\textsuperscript{158} See Jolls, Sunstein and Thaler, A Behavioural Approach to Law and Economics, above n 9 at 1477.


\textsuperscript{160} Vernon Smith notes that ‘[i]n many experimental markets, poorly informed, error-prone, and uncomprehending human agents interact through the trading rules to produce social algorithms which demonstrably approximate the wealth maximizing outcomes traditionally thought to require complete information and cognitively rational actors’. Smith, Economics in the Laboratory, above n 61 at 118 (note omitted).
more forgiving to the lesser informed bargainer demands, the so called ‘curse of knowledge’.161

D Why Calls for Wholesale Reform are either Premature or Ill-informed

Attempts to introduce elements of behaviouralism in the analysis of securities regulation162 have so far been very successful in explaining what is wrong with theories of rationality on which most of fundamental concepts of investor protection regulation are based. They have, however, been very cautious,163 or inconsistent in their normative suggestions. In addition, even cautious proposals for reform have encountered reasoned opposition.164

There are some very good arguments explaining why the findings of BDT cannot, while they remain at a development stage, support a wholesale reform of the current system of securities regulation. Take, for instance, the endowment effect.165 This refers to

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how *ex ante* possession appears to affect valuation decisions. While the endowment effect was originally the province of prospect theorists in economics and psychology, legal scholars soon recognized its relevance as well. The existence of significant endowment effects may have important implications for both our positive understanding of legal rules and how such rules should be designed optimally. However, the endowment effect is made more intriguing by the fact that it appears to be a fairly context-dependent phenomenon. In particular, the effect appears most pronounced in situations where the entitlement in question has few market substitutes, when it has significant use as well as exchange value; and when subjects believe their entitlement was the result of merit rather than luck. By contrast, there is little evidence of the endowment effect playing any role in agency relationship contexts. So it is highly unlikely that fund managers acting for retail or institutional investors allocating their assets will feel emotional attachment of any kind to specific bundles of securities or financial assets and require an unreasonably high price to dispose of them. Therefore, it is


169 See Kahneman, Knetsch and Thaler, Experimental Tests of the Endowment Effect, n 166 above. In fact, most experimental evidence suggests that the *endowment effect* is not present when the underlying right is solely or principally a store of value.


very doubtful whether the endowment effect plays a significant role in the context of financial markets, where stocks, bonds, and other investments are normally nothing more than an exchangeable asset/means used to store value, and agents (fund managers) take most asset allocation decisions for their principals (individual and other institutional investors).

Two other cognitive biases that lead to contradictory conclusions in the context of financial markets are overconfidence and loss-aversion. Overconfidence is a very persistent bias to which both retail and professional investors are very susceptible; thus, it is very likely that any regulatory intervention to counter it would have no practical results.\(^{172}\) In addition, it may be a good countervailing bias to another well documented bias: loss aversion. In turn, loss aversion may be a good antidote to overconfidence, since it leads investors to trade less. Accordingly, in the context of financial markets, loss aversion may prove a welfare enhancing bias, since, as mentioned earlier, empirical research shows that those who trade most in financial markets earn lower returns than less active traders.

Behavioural analysis must also offer a convincing answer as regards the effect of rational learning on individuals’ (including investors) decision-making.\(^{173}\) To understand why investor learning may render redundant new regulation consider the example of tainted analysts’ reports in the late 1990s. That problem received wide publicity and the

\(^{172}\) Prentice, Whither Securities Regulation?, above n 162.

catastrophic results in terms of losses to investors, who followed the reports, were very conspicuous.\textsuperscript{174} Thus, there was a crystal clear case for regulation of such sources of information, for instance, in the mode of Article 6(5) of the EC Market Abuse Directive and its implementing measure,\textsuperscript{175} which prescribe rules for the presentation of investment research and the disclosure of conflicts of interests by the producers and disseminators of such research. However, if a strong form of learning was assumed on behalf of investors, such regulation would seem unnecessary, as it would have had negative effect on market welfare. Implementation of the new rules would have raised the costs of compliance for a business activity (analysts’ reports) which investors would have chosen to ignore having ‘learnt’ from their past mistakes.\textsuperscript{176}

Arguably, views on the effect of learning differ significantly. Some scholars suggest that despite the fact that a few individuals are capable of learning from past experiences, most still take a long time to do so or never learn ‘their lesson’.\textsuperscript{177} Nonetheless, for a number of biases investor education and not the adoption of new regulation may be the most appropriate remedy and the field where financial market regulators should place increased importance.

Finally, proposals to implement regulatory measures to remedy problems of anchoring and limited self-control affecting individuals’ investment decisions would amount to unacceptable restriction of individual choice. For instance, while it is widely

\textsuperscript{174} For an overview see Avgouleas, Market Abuse, above n 138 in chs 3-4.

\textsuperscript{175} Directive 2003/125/EC as regards the fair presentation of investment recommendations and the disclosure of conflicts of interest [2003] OJ L 339/073.

\textsuperscript{176} Cf Bainbridge, above n 89 at 1037.

\textsuperscript{177} See Korobkin and Ulen, Law and Behavioral Science, n 9 above, 1071.
assumed that individuals’ over-borrowing is owed to cognitive errors about interest payments: individuals anchor too much value on initial interest rates,\footnote{Thomas Gilovich and Garry Belsky, \textit{Why Smart People Make Big Money Mistakes -- and How to Correct Them Lessons from the New Science of Behavioral Economics} (2000) in ch. 5.} no meaningful suggestions can be made to counter this bias, beyond what is provided by existing laws (\textit{e.g.}, disclosure of applicable interest rates and consumer education). Any further intervention would probably take the form of explicit recommendations of specific savings and investment contracts, an unacceptable form of soft paternalism.

5. \textbf{BDT and Investor Protection Regulation}

A  \textbf{An Evolutionary Approach to Investor Protection Regulation}

As in all forms of economic behaviour, human beings while conducting investment activity utilize the mental faculties of memory, information processing and attention. These are the exact human faculties that have been associated with the already discussed ‘laundry list’ of fallacies ascribed by BDT to human behaviour. The following paragraphs offer a number of suggestions for the evolutionary reform of current investor protection regulations. The suggested measures are evolutionary in the sense that based on the findings of BDT, they seek to improve existing investor protection mechanisms, as for instance, mandatory disclosure, and not replace them with new ones.

Accordingly, the suggested measures focus on the regulation of investment advertisements/promotions, provision of investment advice, asset management, and issuer disclosure seeking to effectively counter the undesirable results of investors’ bounded rationality and of certain well documented cognitive biases. In the above areas de-biasing may not occur through further investor education, delegation of the task of
choosing investments to professionals, or through mere improvement of the quality of disclosed information.

Investment professionals, though they are normally subject to much less severe biases,\textsuperscript{179} may not be totally trusted to protect their principals’ interests for three reasons. The first reason is conflicts of interest. These are evident both in the case of investment advice and in the field of asset management, where professionals may offer self-serving investment recommendations or follow harmful to their investor/principals short-term investment strategies in order to protect their own interests. The second reason is behavioural biases within organizations, which inevitably affect institutional investors.\textsuperscript{180} The third reason is that investment professionals may feel tempted to manipulate investor biases for their gain instead of trying to protect them from the detrimental impact of such biases.\textsuperscript{181} Thus, regulatory intervention is needed to allow investors to rely on their own devices to adopt the best decision through optimal framing of marketing material and properly structured (even through the use of welfare enhancing rules of default), investment contracts, and create incentives that would align the interests of investment professionals with those of their principals incentivising them to pursue long-term and thus welfare enhancing investment strategies.

\textsuperscript{179} In general, investment sophistication and expertise may modify the use of heuristics and thus the results of attendant biases, see Jolls and Sunstein, A Behavioural Approach to Law and Economics, above n 9 at 1486, and Avgouleas, Market Abuse, above n 138 at 464-465.


\textsuperscript{181} Langevoort, ibid.
The remedies suggested here resemble, to a limited extent, what Jolls and Sunstein have called ‘debiasing through law’; they do not produce confusion or misperception, nor do they violate individuals’ autonomy; moreover, because of their limited scale, and targeted nature they do not constitute overshooting. The above attributes have been held by Jolls and Sunstein to be the determining criteria of any successful ‘debiasing through law’ efforts. In addition, the remedies suggested here follow a strategy of ‘debiasing’ through minimal change of rules at the level of both individual and professional investor.

B Investment Advice, Investment Promotions, Issuer Disclosure, and Investor Cognitive Boundaries

In the field of investment advice and investment promotions, it seems plausible that individual investor categorisation should be expanded in order to reflect the fact that there is a serious heterogeneity within the investor body and that depending on their investment sophistication and expertise individual investors are susceptible to cognitive biases at a differentiated degree. Thus, the suggested division is based on the dual assumption that experts normally avoid most of the cognitive errors of lay investors, and that within the general group of lay investors further sub-division is possible based on their investment experience, track record, education, and financial resources.

182 ‘[W]e define debiasing of boundedly rational actors as using techniques that intervene in and alter the situation that produces the boundedly rational behavior, without operating on the degree of motivation or effort an actor brings to the task. Debiasing through law is then the use of legal rules to achieve such debiasing of boundedly rational actors.’ See Jolls and Sunstein, Debiasing through Law, above n 82 at 10.

183 Ibid. at 29-31.

The identification of biases in the investment decisions of individuals and of institutions, in order to allow for more pluralistic investor categorization, will require a lengthy and large-scale study by psychologists, economists and regulators of investor choices and of their trading behaviour. Serious objections have been raised by Professors Choi and Pritchard as to whether such categorization is at all possible, due to difficulties in identifying and separating expert from non-expert investors. However, given that most investors follow specific trading patterns, certain objective characteristics of trading and investment habits can emerge without serious difficulty. In addition, this gigantic exercise may be less costly than it appears at first glance, since the data that would have to be collected is already at the disposal of investment firms. Finally, its processing could be conducted without revealing individuals’ identities, protecting thus individual investor privacy, and, as stored data would have only historic value, individuals and institutions would not be seriously concerned about experts processing such data in order to identify the kind (and magnitude) of cognitive biases influencing investor decisions.

The suggested expansion of investor classification would not necessarily place a significant new burden on financial services firms, at least in the UK and the EU, for two reasons. First, already the FSA’s COB Rules separate investors into private customers, intermediate customers and market counterparties, and the relevant EC Directive in retail clients, professional clients and eligible counterparties. Although the third case concerns exclusively institutions, the other two are not as clear cut as they seem. There is cognitive biases is one of the major weaknesses of early BLE literature and is not endorsed here. See on the relevant debate within BLE id. at 208-209.

See Choi and Pritchard, Behavioral Economics and the SEC, above n 164 at 66-68.

a class of individual investors, who on the basis of their investment experience may be
categorized as intermediate or professional investors, enjoying thus a lower level of
protection.187 Secondly, computerization and increased sophistication on the part of
compliance professionals would help investment firms to comply with new rules at an
imperceptible cost.

Furthermore, expanding investor categorization seems to be the only immediate
remedy in the case of mandatory disclosure. Since disclosure ‘may not protect investors if
cognitive biases prevent them from rationally incorporating the information disclosed
into their investment decisions’,188 the limitations of bounded rationality should be
resolved through the adoption of other strategies. Thus, a good de-biasing technique
would be increased pluralism (fragmentation) of investor classes and appropriate
modification of the format and volume of information addressed to each class of
investors. Namely, firms instead of producing single format disclosure prospectuses or
one set of other disclosure or marketing documents would have to produce several in
varied formats depending on the kind of investor each document is addressed to. Of
course, all classes of investors should have access to all documents. Securities issuers and
investment services firms involved in the placement and marketing of secondary offers of
shares or distribution of high de-nomination bonds, are very familiar with this format in
the disclosure and marketing material used for such placements. Usually, where such
placements are strictly addressed to professional/institutional investors, securities issuers
and their investment bank agents produce, though they have no obligation to do so, short

187 COB Rule 4.1.9R and MiFID, Anex II.ii.1.
188 Choi and Pritchard, Behavioral Economics and the SEC, above n 164 at 4, 22-23.
form prospectuses, which contain all necessary information to enable investors to make an informed judgment.

Finally, if firms start issuing a variety of documents containing similar facts but the information provided comes in differentiated volumes and formats, depending on the particular investor segment they wish to address, then regulators might accept that the time to take issuer disclosure regimes away from their present straitjacket has come, replacing them with a mixed model of self-regulation and high level disclosure principles.\(^{189}\) This shift would inject more competition and flexibility in global securities markets.\(^{190}\)

C Framing and Investor Choice

As mentioned in section two, framing refers to the way a problem is posed for the decision maker. In this context, framing could materially influence investors’ decision depending on whether relevant risks and returns are presented ‘in terms of the likelihood of a good outcome or in terms of the reciprocal likelihood of a bad outcome’.

To give a simple example, on the basis of what is held by prospect theory and shown in many experimental and empirical settings, it is very possible that people’s choice of a risky investment product with high returns depends on whether the risk embedded in the product is presented, in the advice offered by an investment intermediary or in the marketing (promotional) literature, in terms of potentially reduced gains or of losses. Individuals have been shown to dislike loss much more than they like

\(^{189}\) See on this point Avgouleas, Market Abuse, above n 138 at 227-234.

gains. Arguably, presentation of the product’s risk, in the context of provision of investment advice and of investment promotions, is very likely to make the difference between individual investors decision to buying and eschew an investment product. However, such presentation does not necessarily violate Conduct of Business Rules requirements of fair description and disclosure for documentary financial promotions (COB 3.8.4R) and product disclosure (COB 3.4.4R, 3.4.5R and COB 6.4). Therefore, through appropriate framing investment firms may present a true and fair picture of the risk of the product and still manipulate investors’ choice.

To counter the framing effect, regulators’ rulebooks such as the FSA’s COB rules should take into account the impact of relevant cognitive biases and mandate detailed rules dealing with the presentation of investment information and the structure of investment contracts. Examples of rules that should be amended constitute COB 6.1-6.3 and COB 6.5-6.6 dealing with product disclosure, provision of information on the key features of the product and projections in the case of packaged products, and life- and personal pension policies. Framing of relevant information may also resolve the problem of investor ‘information overload’, a very common phenomenon in most retail investment contracts. The use of experiments can help the regulator to provide optimal guidelines about framing certain financial contracts, namely, presentation of such contracts’ risks and returns.

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191 Packaged products include the entire spectrum of the most common savings and investment contracts offered to retail investors.
Finally, framing can influence the decision to save. Thus, appropriate editing of retail investment and savings contracts could even be combined with appropriate rules of default to direct investors towards the most welfare enhancing solutions. Such rules of default do not restrict choice nor do they affect the decisions of those that are the least vulnerable to the impact of procrastination. The appropriate structure of investment contracts and choice of rules of default could be found through the cooperation of public policy-makers with a strong interest in the pensions’ system such as the Treasury and of major pension and other investment funds with psychologists and experimental economists.

Inspite of their paternalistic nature, the present proposals are welfare enhancing, since, they satisfy the most fundamental prerequisite of asymmetric regulation as measured by the resulting consumer/investor and producer surplus. First, structural mechanisms such as rules of default may moderate the distorting effect of framing. Secondly, while much of what is suggested here calls for narrow categorisation of investors and in some contexts detailed regulation, the advent of Information Communication Technology and the ability of investment firms to amortize relevant expenses make the industry’s cost of compliance with the recommended rules

192 Fetherstonhaugh and Ross, ‘Framing Effects and Income Flow Preferences in Decisions about Social Security’ in Aaron (ed), above n 42 at 187.

193 R. H. Thaler and S. Benartzi, ‘Save More Tomorrow: Using Behavioral Economics to Increase Employee Saving’ (2004) 112 Journal of Political Economy S164. Rules of default that commit individuals to increase their savings in line with future salary increases instead of directing the excess money to consumption could contribute to better savings rates, enhancing the availability of capital resources to the economy as a whole, and leading to retirees with higher disposable income that pose less of a burden to public finances.

194 See Camerer, Issacharoff, Lowenstein, et al., Regulation for Conservatives, above n 12 at 110.

imperceptible. Thirdly, empirical research has shown that savings/investment contracts, which include appropriate choice of defaults, do counter the effects of the status quo bias and of procrastination and have welfare enhancing consequences, especially as regards investment attitudes in the context of retirement savings.196

D Investment Management Contracts and Fund Manager Herding

Professional investors’ career concerns and reputational pay offs motivating ‘herding’ behaviour often are inextricably linked with the issue of comparative performance, namely, by the desire to perform ‘no worse than their major institutional rivals.’197 Fund managers attract investor funds and maximize their management fees on the basis of their short term, usually quarterly, performance. This is measured against the returns on the market index or a number of indices and against the performance of competitors and is published in the fund’s reports and the relevant surveys of the financial press. It also gives professional money managers a strong incentive to ‘herd’.198 Selling an overvalued company, as Enron was, may only have a beneficial effect on the manager’s performance, if the rest of the market holds similar views regarding the specific company’s value and start selling the securities causing a drop in the price. If this does not happen, because, for


197 See Coffee, above n 144 at 329.

instance, of tainted research reports that ‘hype’ the company, then the insightful fund managers, who have expended resources to acquire new information and properly assess it, will only find themselves underperforming their rivals and possibly looking for a new job.

Closer monitoring by the unit holders or the shareholders of the fund may not remedy the above shortcomings in fund manager behaviour, because they are entrenched in the very foundations of the agency relationship that permeates collective investment vehicles. Investors provide the money that ensures fund managers’ lavish salaries in exchange of superior performance. As a result, the fund manager, who knows that she may only survive mistakes that others also make, will choose to herd instead of engaging into active investment strategy. For some commentators this finding explains why institutional investors failed to respond to strong warning signals in the case of the US corporate frauds of Enron, WorldCom, and Adelphia.199

It follows that stricter and predominantly long-term performance measures, inserted by pension fund trustees in the asset management contracts they conclude with their investment management company, may be an effective remedy to check the propensity of fund managers to herd. Accordingly, pension regulations must compel pension fund trustees to do so. Given such approach, professional investors would not feel obliged to assume excessive risk to offset eventual short-term losses,200 in order to, inter alia, avoid reputational risks associated with their failure to meet short-term benchmarks. Moreover, long-term performance benchmarks dis-incentivize frequent

199 See Coffee, above n 144 at 329.

200 See on the incentives that a strong of losses create for fund managers to assume excessive risk Langevoort, above n. 180 at 643.
trading. This would allow fund investors to reap the benefits of reduced transaction costs and higher returns that long term investment policies can bring.

Finally, altering the way investment management firms’ performance is measured would also bring, by default, profound changes in trading patterns in the markets. Fund managers watching on their screens mini ‘bubbles’ to form would refrain from trading, as they would have no fear that a sudden fall or rise in the market would diminish their short term gains and put the client mandate and their job in danger. Highly speculative hedge funds, often castigated as the principal culprits of excessive volatility in the markets, would need to seek money elsewhere and not count on those pouring into corporate pension funds and other collective investment vehicles that would be subject to new rules governing fund managers’ performance. Therefore, the suggested introduction of long term performance criteria, to the exclusion of short-term benchmarks, in the choice of fund managers and evaluation of their quality would indirectly provide a welcome stabilizing mechanism to global financial markets.

E Experimental Economics and Investor Protection Regulation

The possible value of experiments in the ex ante evaluation of new regulation may not be underestimated. As Camerer and Talley observe, empirical approaches suffer from the fact that it is often difficult to stage a truly natural experiment in the real world that implies clear causal conclusions. This is clearly an area where laboratory approaches have an advantage and ‘at the very least good experimental designs are likely to provide a complementary and confirmatory check on empirical methods.’201 Therefore, experimental economics offers a great tool for the ex ante evaluation of regulatory

201 See Camerer and Talley, above n 62.
policies. Admittedly, the cost benefit analyses conducted today by the most influential regulators of financial markets in the world, namely, the US Securities and Exchange Commission, the Financial Services Authority in the UK, and the EU Commission, are perfunctory in the best of cases.\textsuperscript{202} Experimental economics would add credibility to the superficial constructions that count so far as regulatory cost-benefit analyses.

As mentioned in the previous sections, experimental research methods\textsuperscript{203} and especially those used by experimental economists could prove very useful in devising proper disclosure formats and investment contract layouts in order to counter investor bounded rationality and the framing effect. They are also particularly apt at evaluating the design and rule structure of new markets. The aid of Information Communication Technology may render even large scale testing cost-effective and definitely cheaper than ineffective and disruptive regulations. The usefulness of economic experiments\textsuperscript{204} in advising policymakers, \textit{ex ante}, about policy interventions has been proven in a number of contexts, including the facilitation of the setting up of double auction electronic markets, and the design of recent telecommunication spectrum auctions.\textsuperscript{205}

\textsuperscript{202} Indicatively, see E.H. Fleischman, ‘Dear Mr President’ (1993) 5 \textit{Journal of Applied Corporate Finance} 9 at 12–15.


\textsuperscript{204} Camerer and Talley describe experiments as ‘the creation of a situation controlled by the experimenter (to some degree), for the purpose of testing a general theory or establishing causality’. See Camerer and Talley, above n 62 at 5.

assisted experiments in electricity markets have, in fact, informed to some degree the
deregulation of relevant markets in Australia and New Zealand and the successful
creation of a wholesale market for electricity in Australia. 206

Naturally, the environment in a social sciences laboratory is much different and
less complex than the real world. So the recipients of any research conducted through the
methodology of experimental economics should bear this in mind. Yet there is nothing to
indicate that there are flaws with the ‘external validity’ or, as Camerer and Talley
describe it, ‘generalizability’ of economic experiments, even if they pertain to large scale
regulatory interventions. Provided that the theory or set of rules tested is general, its
assumptions in an experimental design carefully created (so called ‘internal validity’), the
statistical data includes a sufficiently large sample, and the analysis of experimental data
follows the rules of ‘good statistical control of any type of data’, then there is no reason
why the results of experiments do not have a serious bearing on real life situations. 207

A good and fertile testing ground of the above proposal could be the
Commission’s plans to create a single market in the EU for residential mortgages. 208
These would greatly benefit from some *ex ante* experimental research, not so much in
respect of market design (*i.e.* design of the trading venue and transaction format), as in

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206 S. J. Rassenti, V. L. Smith, and B. J. Wilson, ‘Using Experiments to Inform the
Privatization/Deregulation Movement in Electricity’ (2002) 21 Cato Journal 515 at 515-519,
521-523.

207 Camerer and Talley, above n 62 at 7-10.

terms of rule infrastructure, since experimental economics is particularly apt at isolating the effects of the rules of the game by which markets are organized.\textsuperscript{209} Admittedly, the current fragmentation of the residential mortgage market in the EU is not due to regulatory barriers but rather to cultural and linguistic differences.\textsuperscript{210} Thus, an experiment using as a sample a large number of consumers from the totality of the member states would provide some credible evidence as to whether the enactment of (maximum) harmonization legislation in this area would help consumers overcome the current confidence issues and buy mortgage credit cross-border or the confidence problem would persist. If the outcome of relevant experiments were to show persistence of such confidence issues, then the Commission’s plans for large scale and possibly expensive harmonisation, with the attendant disruption of national consumer protection systems, would have to be reconsidered. This approach to \emph{ex ante} evaluation of new EC financial services legislation would keep in accord with the Commission’s expressed objectives in enacting new financial services legislation as expressed in its White Paper on financial Services Policy for 2005-2010.\textsuperscript{211}

6. Conclusion

Based on the findings of BDT, behavioural finance has raised serious questions about the soundness and validity of the rational investor model, a fundamental concept of investor

\textsuperscript{209} A. E. Roth, ‘The Economist as Engineer: Game Theory, Experimentation, and Computation as Tools for Design Economics’ (2002) \textit{70 Economica} 1341. Alvin Roth, a leading game theorist, is a Professor of Economics at Harvard and has been instrumental in incorporating game theory and experiments in designing innovative markets.

\textsuperscript{210} Commission, Green Paper on Financial Services Policy, above n 208 at 12 and Annex I, Section IV.

\textsuperscript{211} White Paper, above n 208 at 6.
protection regulation. Yet the debate over the actual impact of BDT on investor protection regulation and the neighbouring system of rules concerned with the prudential regulation of the savings and investments industry is far from having reached a definite conclusion. First, the behavioural law and economics assault on the Winter Palace\textsuperscript{212} of rational choice theory within the empire of law and economics has not been very successful due to its maximalistic approach. Secondly, the absence of a unified theory explaining cognitive biases and the lack of internal coherence in the normative propositions made by BDT scholars are bound to perennially undermine their calls for radical law reform. As a result, the rational choice belligerents may have less to fear than it was previously contemplated. Change will come through evolution and osmosis between rational choice theory doctrines and the more pragmatic views that BDT takes in a number of real life situations.

A characteristic example is the field of investor protection regulation. While behavioural finance has offered convincing explanations about the impact of biases on investor behaviour and asset prices, its findings do not, at present, support wholesale intervention in the current model of investor protection regulation. Accordingly, calls to abolish mandatory disclosure regimes or radically reform the regulation of investment intermediaries remain unsustainable.

On the other hand, BDT does provide strong support for piecemeal regulatory intervention. In this context, it has been argued in this article that conduct of business rules dealing with the provision of investment advice and investment promotions as well as mandatory disclosure rules should provide for differentiated formats and volume as

\textsuperscript{212} The most graphic depiction of the historical events that led to the unsuccessful 1905 revolution in Russia is, of course, Sergei Eizenstein’s film ‘Battleship Potemkin’ (1925), one of the masterpieces of world cinematography.
regards company information to be disclosed to investors or investment and marketing information to be presented to clients. The criterion for such differentiation should be very pluralistic investor categorisation following further fragmentation of current investor classes under COB and public offer rules. In addition, the effect of *framing* on investment decisions made by individual investors would be countered through the use of pre-determined wording and layouts for similar groups of investment contracts. Finally, as regards the regulation of asset management services, fund managers’ herding would be checked through the mandatory insertion into pension funds’ constitutional documents of provisions obliging their trustees to choose investment managers and evaluate fund manager quality through the exclusive use of long term performance criteria. This policy would force fund managers to focus less on short term performance that encourages herding behaviour and leads to stock market bubbles.

None of the policy recommendations discussed here is interventionist to an unacceptable degree; they do not seriously restrict individual investors’ or fund managers’ choice of investments nor do they affect the investment decisions of rational investors. In addition, focussed as they are on specific situations, much in accord with BDT’s attention to context, they may easily be implemented as part of a limited scale and piecemeal reform of some of the FSA’s rulebooks or of the EC’s financial services legislation.

The era of critical scrutiny has succeeded the times of certainty in the analysis and formulation of investor protection regulation. Law-makers and regulators should encourage research on the impact of cognitive biases on investor behaviour, the performance of the markets, efficient allocation of resources and general market welfare.
instead of viewing the advancements of BDT with trepidation. Arguably, experimental methods should have a much bigger impact in the future on the design and formulation of new regulations for financial markets.

Overall, the incorporation of the best documented of BDT’s findings into investor protection regulation must be cautious, gradual, and in an evolutionary fashion. BDT is only taking its first steps outside the walls of social laboratories and is still marred by theoretical and empirical controversy. Nonetheless, the above do not mean that the full story has yet been told. Should neuroscientists confirm the findings of cognitive psychologists and behavioural economists about the role of emotion in investment decision-making, this article could prove to be a very peaceful prelude to a tempest of calls demanding full scale reform of the current system of investor protection regulation.