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**Behavioural economics perspectives:
Implications for policy and financial
literacy**

Morris Altman

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Behavioural Economics Perspectives: Implications for Policy and Financial Literacy*

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Executive Summary

This paper summarizes and highlights different approaches to behavioural economics. It includes a discussion of the differences between the “old” behavioural economics school, led by scholars like Herbert Simon, and the “new” behavioural economics, which builds on the work of Daniel Kahneman and Amos Tversky and is best exemplified by Richard Thaler and Cass Sunstein’s recent book, *Nudge*. These important currents in behavioural economics are also contrasted with the conventional economic wisdom. The focus of this comparative analysis is to examine the implications of these different approaches in behavioural economics for financial literacy.

The Simon approach argues that intelligent people can make decisions that appear irrational from the perspective of conventional economic wisdom. However, these decisions are typically the right ones for the individuals making them and are often based on how the brain is wired as well as on the decision-making environment these individuals face. Errors in decision making can be made if rationality is bounded—that is, if the quality of information used is poor or the information is framed in a misleading fashion. Also, the decision-making environment might be such that individuals don’t have the right incentives to make ideal choices. Finally, individuals may not have the knowledge base to make ideal choices in finance-related matters. Therefore, financial decision making can be improved by providing decision makers with better quality information presented in a non-complex fashion, an institutional environment conducive to good decisions, and financial education that will facilitate making the best use of the information at hand within a specific decision-making environment.

The Kahneman-Tversky approach is more focused on nudging or even legislating rules that drive choice in desired directions as defined by experts, as opposed to educating the decision maker. This perspective, often referred to as libertarian paternalism or light paternalism, holds that decisions may be inconsistent with conventional economic wisdom norms for rational decision-making because they are based on how the brain is hard-wired. Because it is difficult to alter hard-wired behaviour, decisions are often error-prone, biased, and irrational. Financial education plays a much smaller role in improving choice behaviour in this approach than in Simon’s or the bounded rationality approach to behavioural economics.

However, by recognizing the importance of the quality of information and how it is presented or framed for a decision maker, behavioural economics in general opens the door for public policy to improve the overall decision-making environment. It helps us understand why it is critically important to improve financial literacy. This is particularly the case with the Simon approach and its focus on the quality of the decision-making environment married with a strong dose of financial education. This approach holds that improved financial education allows decision makers to take advantage of an improved incentive and information decision-making environment. Little attention is paid to nudging or manipulating choice in a particular manner. Individual choice is largely respected, as in traditional economics, unless choices are deemed to cause social harm.

Introduction

A standard definition of financial literacy is “having the knowledge, skills and confidence to make responsible financial decisions.” The institutional environment is also important to financial decision making and greatly affects choices, influencing the extent and quality of relevant information and incentives. Financial literacy is of increasing concern to government and other public policy makers. Surveys in OECD countries find that financial literacy is very low amongst individuals and households irrespective of income and education, especially amongst groups with lower income and less education. Even stock ownership and trading in financial assets do not appear to improve the level of financial literacy. Most people have difficulty answering questions about compound interest, inflation, or risk diversification, and difficulty understanding budgeting and saving programs and financial information in general. This appears to be the case in Canada, the United States, the United Kingdom, Australia, New Zealand, Korea, and the Netherlands (Munshaw 2008, OECD 2005, Yoong 2010). Serious gaps in financial literacy are of mounting concern, with the increasing number of financial products and services on the market, their increased complexity, and the escalating importance of financial decision-making to individuals and society at large, especially as life expectancy is increasing.

The topic of financial literacy raises the issue of the potential role that might be played by education, quality information, and incentives in improving decisions. It can be argued that with a less than ideal education, information set, and incentives, individuals cannot make the best decisions. By contributing to financial literacy, financial education contributes to more informed and effective decisions on financial matters such as contributions to pensions, use of credit cards, household budgeting, mortgages, and investing on the stock market. Improvements to relevant information, with a focus on quality (and truthfulness), make possible the effective use of financial education. Financial education and quality information go hand and hand, forming key ingredients to effective financial literacy.

This perspective on financial literacy, I would argue, runs contrary to the standard economic wisdom. It presumes that individuals have the physiological and psychological capabilities, and are in an informational, governance, and social environment, that will allow them to make optimal decisions. If the typical individual is so endowed, financial education can have little impact on improving choices. In effect, one might argue that in the conventional approach individuals either are assumed to be financially literate or that they make choices consistent with financial literacy, and that financial literacy can be improved only if individuals persistently make unwise choices that can be corrected by interventions in the decision-making process or in the decision-making environment.

Research in behavioural economics suggests assumptions that are quite different. There are two key perspectives in behavioural economics that yield distinct implications for financial literacy and financial education (Altman 2009), both of which deny that individuals typically behave as rationally as assumed by conventional economics. Behavioural economics also questions the conventional assumption that the environment in which financial decisions are made is necessarily ideal.

This paper discusses the implications of the two approaches of behavioural economics for possible improvements to financial literacy and, therefore, to financial decision making. What I refer to as the Kahneman-Tversky approach maintains that individuals make systematic errors and biases in decision making that are largely rooted in the hard-wiring of the brain. Errors and biases occur when individuals deviate from conventional (neoclassical) decision-making rules. Education can have little effect on such behaviour. This approach is much more supportive of government policy that nudges consumers into making decisions that some might argue are in the best interest of consumers. Experts are assumed to know better than individual decision makers what is in their best interest (Thaler and Sunstein 2003, 2008; see also Camerer, Issacharoff, Loewenstein, O'Donoghue, and Rabin 2003; de Meza, Irlenbusch, Reyniers 2008; Shefrin 2002; Thaler and Sunstein 2003, 2009; see Sugden 2008, 2009, for a critique of Thaler and Sunstein).

What I refer to as the Simon-March approach argues that individuals are physiologically incapable of behaving as prescribed and predicted by conventional economic wisdom. As a result, they develop heuristics, or experience-based decision-making shortcuts, to make choices that are rational even though often inconsistent with the conventional behavioural norms. It is also recognized that the typical choice environment is characterized by asymmetric information, incomplete information, and even false information and poor education. Both physiological and environmental constraints can, but need not, result in errors in decision making, such as relatively poor investment decisions. Because choice environments can be changed, this approach provides a much stronger rationale for enhancing the quality of financial decision making through improvements to financial education and the decision-making environment. This would include improved access to and improved availability of quality and pertinent information, appropriate decision-making rules and regulations, and appropriate financial education. On the whole, individual preferences, which are regarded as multi-faceted across decision makers, are respected and less attention is paid to nudging unless individual choices can be shown to cause social harm. This perspective is well reflected in the research of Shiller (2001, 2008, 2009, 2010), a leading behavioural finance scholar.

These different approaches to financial decision-making are summarized in Table One.

Table One	
Comparing Different Approaches to Decision Making	
1. Conventional economic theory	<ul style="list-style-type: none"> • Individuals make intelligent decisions, and they do not regret them. Their choices reveal informed and well-considered preferences. • An ideal decision-making environment is assumed. • Education and training (referred to as human capital formation) are regarded as important means of enhancing productivity. But no clear theoretical mechanism is specified linking improvements in the quantity and quality of education and improvements in decision making. • Human capital formation provides important theoretical space for explaining errors or less than ideal decisions, a space well-taken by behavioural economics. • Financial decision-making is assumed to be best-practice unless distorted by government interventions in the market and in decision making.
2. Behavioural economics: Kahneman-Tversky, Errors and Biases Approach	<ul style="list-style-type: none"> • Individuals tend to make irrational, error-prone decisions, which they eventually regret. • Errors and biases in decision making are wired into the brain architecture. • It is possible for the decision-making environment to be less than ideal. • Individuals often do not know what is in their own best interest. • The benchmark for rationality in decision making is based on conventional economics and focuses upon calculating behaviour. • Decision-making shortcuts are regarded as typically error-prone. • Individuals are easily fooled and deceived by how questions are framed and often reverse their preferred decisions with inconsequential changes in how questions or options are framed. • Education can sometimes improve decision making. • Government intervention in decision making is often thought to be the best-practice route to take for ideal choices to be made. • Financial decision-making will be biased and error-prone without government intervention in choice behaviour. • Some success predicted for improvements in the decision-making environment, less for the improvements to financial education.
3. Behavioural economics: Simon, Bounded Rationality, Rational Individuals Approach)	<ul style="list-style-type: none"> • Individuals are assumed to make rational decisions as a result of how the brain is wired and the decision-making environment. • Conventional benchmarks for rational or intelligent decisions are often rejected. • Decision-making shortcuts are rational more often than not, even when they contravene conventional economic benchmarks. • Individuals are not easily fooled, but they can be misled. • Individuals can make decision-making errors and these can lead to decisions that are subject to regret. • A major source of decision-making errors is a less than ideal institutional environment. • Education can have important effects on decision making. • Government plays an important role by establishing an ideal institutional environment and by providing the education required for ideal choices to be executed. • Government should not intervene in individual choices unless these choices can be shown to cause harm to others. • Financial decision-making can be improved by improving the decision-making environment and through improvement to financial education. • Government intervention in choice behaviour is not considered to be best-practice if individuals make decisions in an ideal decision-making environment and with appropriate levels of financial education.

The Conventional Wisdom

The standard set of assumptions of the conventional wisdom is well articulated by Herbert Simon (1987), who was awarded the Nobel Prize in Economics in 1978 for his contribution to the then nascent field of behavioural economics. He argues that the essence of the conventional economic decision-maker is embodied in the notion of *Homo Economicus*, which is characterized

by: (1) a stable set of preferences or wants or desires; (2) perfect knowledge of alternatives relevant to a choice problem; (3) the ability to forecast the expected consequences of particular choices in the present and into the future even when the future is highly uncertain; (4) the ability to make use of this knowledge to maximize personal economic well-being or happiness; (5) rapid updating of behaviour based on new information (Bayesian updating); (6) consistency in the choices made by the individual; and (7) the insubstantial role of emotions and intuition in decision making (p. 221).

An underlying assumption of these analytical assertions is that individuals have unbounded knowledge of relevant choice alternatives and unbounded computational capacities to determine outcomes of alternative choices. Individuals are assumed to make such choices independently of other individuals. They are unaffected by other people's choices. It is also assumed that individuals have the capability and power to make the choices that they prefer to make. Other individuals do not, therefore, interfere with these choices. Moreover, it is assumed that rational decision-making takes place independently of emotional and intuitive behavioural drivers. Finally, it is assumed that rational individuals are narrowly selfish, most interested in maximizing their own material well-being. Deviations from such narrowly self-interested behaviour will not be welfare-maximizing (or maximizing happiness) and hence would be irrational. It is further assumed that individuals' choices are sensitive to relative prices and income levels as well as to changes to these variables. The latter assumption refers to an underlying premise of the conventional wisdom, accepted by most behavioural economists, that incentives matter in decision making.

Fast and Frugal Decision-Making (Smart Heuristics)

With regards to the rationality or smartness of choice behaviour, James March (1978), a close associate of Simon and one of the pioneers of behavioural economics, argues that individuals are typically rational or intelligent when it comes to engaging in decision making even if their behaviour is at odds with conventional heuristics. What appears irrational from the

perspective of the conventional wisdom might be very rational and intelligent if one digs a bit below the surface (p. 589).

Herbert Simon led the way in developing behavioural economics as an analytical perspective to better explain rational human choice behaviour or decision making that is consistent with real human beings facing real world environmental constraints. He develops the concepts of bounded rationality and satisficing (as opposed to maximizing) to better classify, describe, and analyse real-world choice behaviour. Keys points made by Simon (1987a) include the notion that one's definition of rationality must be derived from an understanding of actual human behaviours and capabilities and environmental constraints and facilitators. Moreover, benchmarks for rational behaviours need be based upon an understanding of what human agents are capable of doing in the real world—a type of real-word modelling scenario to help identify best-practice decision-making rules to optimize human well-being or welfare.

Building on the research of Simon and March, Gerd Gigerenzer (2007) developed the notion of fast and frugal heuristics to highlight how non-conventional decision-making, often driven by emotional and intuitive variables, results in effective and efficient decisions. These can include decisions made on financial markets or dealing with financial matters in a complex world where uncertainty is prevalent, information is imperfect and asymmetric, and information processing costly. This approach to an understanding of choice behaviour or decision making is also referred to as ecological rationality. One should note that the fast and frugal approach to decision making stands the errors-and-biases approach on its head since what is irrational from the latter perspective, where emotion and intuition yield poor decisions, can be most rational in the fast and frugal narrative. Emotive and intuitive factors are part of the complex decision-making toolbox of the evolved human brain that helps generate relatively intelligent decisions in an efficient and effective fashion.

This type of analytical paradigm sits well with and is informed by ongoing pioneering brain research, which finds that optimal decision-making *cannot* be largely or typically based on

rationality benchmarks that simply focus on calculating and logic-based behaviour, and where emotions and intuition are treated as obstacles to rational decision-making. Rather, emotion and intuition play a vital role in rational decision-making. Research has shown that individuals who suffer damage to the emotional part of the brain are no longer able to engage in rational decision-making. Previously successful individuals become socially inept even at making and delivering such basic decisions as deciding what to buy and what to do during the day.

Antonio Damasio (2006) pioneered the research identifying the positive importance of emotions to rational decision-making, referred to as the somatic marker hypothesis. In this modelling framework, emotions allow people to act smart without having to think smart, at least in many significant instances.

Nobel Laureate Vernon Smith (2003, 2005), who pioneered the development of experimental economics, also makes the case, based on his empirical research and that of his colleagues, that individuals typically don't make decisions using prescribed conventional economic (neoclassical) decision-making rules. Smith argues that this is not a sign of irrationality in individual choice behaviour or of sub-optimal behaviour. Rather, non-conventional behaviour can even result in superior economic results.

Simon refers to the proposition that rationality (smart behaviour) is contingent upon environmental conditions and physiological constraints and not upon exogenous and arbitrary benchmarks, such as in the case with conventional economics, as process rationality. Smith, building on Gigerenzer's most recent research as well as earlier work by Friedrich Hayek, refers to this type of context-dependent rationality as ecological rationality. Behaviour is ecologically rational if it is adapted to the structure of the environment and is best suited to the physiological make-up of the individual (such as computational limitations). For Smith and Hayek, individuals typically do the best they can do (satisficing), and tend to naturally evolve towards optimal (best-practice) behaviour. However, even Smith argues, like Gigerenzer and Hayek before him, that

whether or not best-practice behaviour evolves can be contingent upon institutional parameters and learning.

With regards to financial education, the concepts of procedural and ecological rationality open the doors to the possibility that education might affect and improve choice behaviour. At one extreme, the ecological (Smith-Hayek) perspective on behavioural economics suggests that decision makers and institutions naturally evolve towards best-practice decisions, albeit these decisions need not and typically will not be rational from a conventional economics (neoclassical) perspective. This extreme perspective, just like its conventional economics counterpart, would close the door to financial education as being of much value in generating better decisions from the individual decision-maker's point of view and for society at large.

In the behavioural economics paradigm pioneered by Simon, although individuals are typically rational, that is smart, when engaging in decision making, mistakes or errors can be made, which can be referred to as rational errors (Altman 2009). These might include making poor investment decisions that could have been avoided, like not investing adequately in pensions, or choosing a poor credit card option. From this perspective, informational, information processing, and institutional parameters play a key role in generating such errors. Better information, greater clarity in how information is presented and framed, and improved incentives, could fix such rational errors.

But even when choice behaviour is at its smartest, outcomes from the decision-making process need not be optimal or rational from the perspective of society at large. Individual decision-makers in the financial sector, for example, might be satisficing and ecologically rational from their own perspective (maximizing their own wealth), but they might be bankrupting institutions (theirs and others') in the process if the institutional parameters are not appropriate. Such behaviour can result in exceptional financial bubbles and busts that might cause great social harm, severely damaging the financial well-being of the many while benefiting the few. Such bubbles and busts can be a product of the rational and even optimal decisions of a

few key decision-makers. Another example of such privately rational but socially irrational decision-making is the problem a gambler creates by maximizing her or his happiness while having a disastrous effect on the family's financing and well-being. In these instances, institutional change and the incentives embodied in institutional change might be of greater importance than education in affecting behaviour.

Institutions Matter

The Simon-March tradition of behavioural economics makes an important contribution by assigning a key role to institutional parameters in producing optimal decisions, unlike scholars following in the Kahneman-Tversky (errors and biases) perspective, who focus almost exclusively on psychological variables. From the Simon-March perspective, satisficing and non-neoclassical rational behaviour (bounded rationality) takes place in the context of institutions within which individuals engage in decision-making and choice behaviour. Once the importance of institutions and related incentives (which should include social norms and rules and regulations) are placed front and centre as part of the analytical discourse, one can make more sense of socially irrational but individually rational (satisficing) behaviour, such as behaviour that maximizes the wealth of individuals while leading to severe recessions and large-scale bankruptcies of financial institutions.

In fact, a pioneer of a highly libertarian approach to economics, Friedrich Hayek argues that appropriate institutions are a pre-requisite if rational individual choice in all its complexity and diversity is to yield optimal (welfare maximizing) or rational social outcomes. Hayek (1949) writes, in the tradition of Adam Smith, that individualism was “a system under which bad men can do least harm” (p. 11). This requires institutions that induce people to voluntarily contribute to the social good. Without such institutions socially beneficial outcomes need not be obtained.

From this perspective, financial education can change behaviour. But the extent of this impact is mitigated by the institutional parameters in place at a given time. Improved decision-making requires appropriate financial education plus appropriate institutions. One cannot be

expected to work without the other—they are two blades of the scissors required to produce ideal choices in financial matters from both an individual and social perspective.

Errors and Biases and “Irrational” Heuristics

Dominating behavioural economics at present is the perspective developed by Daniel Kahneman and Amos Tversky, that individual decision-making is characterized by persistent biases and errors in choice behaviour. Humans develop heuristics to engage in decision making. Because these differ from the neoclassically prescribed norms for choice behaviour, they are deemed to represent error-prone or biased ways of acting, and considered by many scholars to be irrational.

Tversky and Kahneman (1974) stress the importance of neoclassical norms as the benchmarks for rational behaviour (p. 1130). What is critical to the popular and pervasive Kahneman and Tversky approach is the central role of emotion and intuition as the basis of choice irrationality in decision making, as opposed to the physiological and environmental variables stressed by the Simon-March approach to behavioural economics. Emotion and intuition can result in decision making that is short-sighted and subject to regret in the longer run; that is, in behaviour that is inconsistent with rationality, according to Tversky and Kahneman (1981). However, the emotional and intuitive side to the decision-making process might be subject to some control and re-education (p. 458).

In a nutshell, Kahneman and Tversky’s key proposition, much of it articulated in prospect theory, relates to how emotive factors, rather than objective decision-making benchmarks, drive the decision-making process. The critical empirics that underlie prospect theory are:

1. On average, individuals have a preference for outcomes that are certain, even if their monetary value is less than that of the uncertain outcome. For example, a person prefers a certain (100 per cent probability) \$100 option over an option where there is an 80 per cent chance of obtaining \$140 and a 20 per cent chance of ending up with nothing. The latter

yields an expected return of \$112. Individuals are "irrationally" willing to sacrifice \$12 to gain a certain outcome.

2. On average, individuals weight losses more than gains. For example, based upon Kahneman's and Tversky's research, a \$100 loss would be given a weight of 2.5 and a \$100 gain would be given a weight of 1. If one gains \$100 and loses \$100, one ends up with no net change in income or wealth. Objectively speaking, from a materialist (neoclassical) perspective, this type of event does not and should not affect one's well-being. However, prospect theory suggests that an individual's well-being will fall by quite a lot in this scenario as a result of the subjective (emotionally based) weights that individuals differentially attach to losses and gains. This causes individuals to be loss-adverse—to feel particularly bad about losses.
3. Individuals' subjective well-being is affected by their relative standing and changes to their relative standing in terms of losses and gains. Absolute levels of wealth are less important than changes to wealth. For this reason, the reference point that the individual uses when making decisions is important, and these reference points are subjectively (thus not rationally) determined.
4. The framing of options or prospect affects decision making. When events are framed positively, individuals tend to choose them over the same events framed negatively. This should not happen when the different frames have no substantive effect on events—packaging should not affect decision making. Since such frames do affect decision making, individuals are subject to perceptual or cognitive illusions. Related to this, individuals can be easily manipulated by frames. This is referred to as the framing effect. Such behaviour is considered to be irrational or biased. However, one should note that it is not clear that differential framing will affect choice behaviour when prospects or rates of return are substantively different. People can be fooled when the cost of being tricked is not all that great. In the same vein, Gigerenzer

(2007) makes the point that in a world of imperfect information and uncertainty or of bounded rationality (the real world), frames signal information about the event. When an event is positively or negatively framed, individuals read between the lines, attempting to extract surplus information from the frames. A positive frame suggests a better choice than a negative frame. This is a judgment call that might prove to be incorrect. But it is a rational choice in a world of bounded rationality and uncertainty. However, this does not distract from the suggestion that frames can be manipulated such that smart people can end up making rational errors in their decisions, yielding choices that they might not have made had there been better cognitive frames in place (pp. 99-100).

As part of the Kahneman-Tversky perspective, the following are identified as key cognitive biases (there are said to be many others) in decision making:

1. Overconfidence: Individuals overestimate their decision-making capabilities. As a result, individuals engage in risky behavior in activities beyond their objective capacity to succeed.
2. Herding: The tendency of individuals to mimic the behaviour of others can result in cascades of particular choices. Herd behaviour occurs even when other individuals' behaviours are error-prone in the long run.
3. Loss aversion (related to prospect theory).
4. Status quo bias and the endowment effect: Individuals show a preference for the status quo even when it does not yield higher levels of material welfare. One example would be an individual valuing an asset by more than its purchase price even though its market value is not increasing. Possession in itself increases the value of the item possessed in the eyes of the individual endowed with this asset.
5. Framing effect (related to prospect theory).

6. Anchoring: Individuals tend to anchor their choices to reference points that are not objectively relevant to the decision at hand. This relates to what is referred to as the recognition heuristic (see below).

One important implication of the Kahneman and Tversky perspective to behavioural economics is that because individual decision-making tends to be irrational, error-prone or biased for emotive reasons—and, related to this, because of the role heuristics play in decision making (which can involve intuition)—external intervention can be justified in choice behaviour. Experts (or bureaucrats informed by experts), coming from a rational benchmark, can affect the decision outcomes or choices of individuals by regulating choice behaviour or by encouraging particular choices based upon what is taken by an expert to be optimal choices, which the expert believes to be in the best interest of the individual. Such intervention could take place even if an individual's choices are not encumbered by negative externalities and, therefore, cause no harm to others.

This line of thinking is expressed quite eloquently by Thaler and Sunstein (2008):

“Individuals make pretty bad decisions in many cases because they do not pay full attention in their decision making (they make intuitive choices based on heuristics), they don't have self-control, they are lacking in full information, and they suffer from limited cognitive abilities.” (p. 6)

As a consequence, individuals should be nudged towards rational choices. People who oppose choice architecture, they argue, do so because they make the false assumption that “almost all people, almost all of the time, make choices that are in their best interest or at the very least are better than the choices that would be made by someone else. We claim that this assumption is false. In fact, we do not think that anyone believes this on reflection.” (p. 11). This implies that education cannot be expected, with any degree of confidence, to do the trick in affecting choice behaviour. Choice architecture is a way of framing choice options so that people can be nudged or manipulated into making the “correct” or rational choices.

Financial Education and Literacy and the Different Faces of Behavioural Economics

The different approaches to economics imply various attitudes toward the potential for education and learning to affect choice behaviour. Conventional economics suggests that financial education can do little substantively, since individuals are behaving neoclassically, making choices consistent with neoclassical behaviour, or are quickly forced into behaving neoclassically by market forces. Behavioural economics, on the other hand, has provided us with an abundance of evidence that individuals do not behave neoclassically (Altman 2006; Akerlof and Shiller 2009; Gigerenzer 2007; de Meza, Irlenbusch, Reyniers 2008; Roubini and Mihm 2010; Kahneman 2003; Shefrin 2002; Shiller 2001; Wärneryd 2001). Whether that behaviour is rational, however, depends on what approach to behavioural economics one subscribes to. Therefore, these differing approaches proffer different prescriptions as to what can or should be done about current decision-making processes or outcomes that do not accord with the conventional economic or neoclassical benchmarks for what are considered rational behaviours and rational choices. Just as with conventional economics, what determines how the different strands of behavioural economics regard the potential impact of education on financial decision-making very much hinges upon which benchmark is used for determining rational behaviour and what are thought to be the critical determinants of individuals deviating from the acceptable rationality (smart decision-making or choice) benchmarks.

In other words, from the perspective of the conventional wisdom, education can do little to influence finance-related decision-making since it is assumed that individuals behave according to the dictums of optimal neoclassical rational behaviour or generate choice outcomes consistent with neoclassical rationality benchmarks. The mainstream of behavioural economics, dominated by the Kahneman-Tversky perspective on human choice behaviour, regards the average individual's decision making to be dominated by persistent errors and biases and irrational behaviour using conventional economic or neoclassical benchmarks for rational behaviour. Moreover, the average individual is thought to be subject to persistent cognitive illusions and therefore easily manipulated by the framing of options or prospects. This opens the

doors to intervention in the realm of decision making and choice in many dimensions, including educating people to behave more rationally. Since emotion and intuition are regarded as key culprits in driving irrational decision-making and, therefore, irrational choice, educating people to better control their emotive side would be a critical function of financial education from the Kahneman-Tversky perspective in behavioural economics.

Simon's perspective on behavioural economics agrees with the Kahneman-Tversky worldview, that individuals do not behave neoclassically. But it disagrees in that it does not necessarily find decision making and resulting choices to be irrational. Rather, more often than not, choice behaviour is considered to be ecologically rational or rational from a process perspective. Neoclassical norms are not used as benchmarks for how rational people should behave. Moreover, emotion and intuition are viewed as often playing an important *positive* role in real world decision-making. But this does not imply that individuals cannot make errors in decision making (rational errors) or that rational individual choices cannot generate socially irrational results. Errors in decision making can be based, for example, on imperfect and misleading information, poor incentives, and the inability of individuals to make their preferred choices.

Financial education can improve decision making (result in fewer errors) by providing individuals with better information and understandings of decision problems and the means to be better able to process this information. Moreover, in the Simon-March worldview, such financial education would have most impact if it were structured to minimize processing time and designed to minimize the complexity of information. This recognizes the brain as a scarce resource and the human proclivity to use fast and frugal heuristics (Gigerenzer) in decision making (including information processing). Finally, in the Simon-March approach, institutions play a key role in determining the choices people make. This approach is one which would be much more libertarian in its approach to financial decision-making. It would be much less concerned with

outcomes than with providing people with the means to make decisions and choices that they prefer to make, unless such privately maximizing decisions causes social harm.

Shiller (2008) provides an example of the Simon-March approach when making the case that one cause for bad investment decisions is bad information and bad arguments. He favours the provision of higher quality information and the better dissemination of such information as one very important mechanism with which to improve financial decision-making. And, he argues, government should subsidize this since it would be socially beneficial (Shiller 2008, 2009).

Shiller writes:

Financial advice is in some respects like medical advice: we need both on an ongoing basis, and failure to obtain either can impose costs on society when our health—physical or financial—suffers. There's a strong case to be made that the government should subsidize comprehensive financial advice ... to help prevent bubbly thinking and financial overextension.

Getting into the specifics of quality information, Shiller (2010) argues for regulated labelling for financial products analogous to required nutritional labelling for food products as a means to improve financial decision-making. He argues that labels should be designed to provide consumers with basic information in a relatively easy to read and understand format, one that does not send false signals to potential buyers of financial products. Labels should include *understandable* information on risk and returns. Shiller (2010) maintains:

Including such information on financial products would give an enormous boost to the efficiency and efficacy of our financial products in serving customers' needs. The only reason that such labeling has not yet been required is the same reason that nutritional labels were not required long ago on foods. Public outcry at a time of scandal forced progressive change then; we should hope that it does so now.

Linkages Between Financial Issues, Financial Education, and Financial Literacy

The approaches to financial education and financial literacy that flow from the differing methodological perspectives within behavioural economics can be illustrated and highlighted by looking at how these different methodological narratives would engage financial education to tackle key areas of consumer decision-making on financial matters. Arguably, of particular importance to many is the underinvestment in pensions and business-cycle behaviour with regards to investments in the stock market. Also of importance is the trust heuristic, a fast and frugal heuristic often employed in financial decision-making.

Pensions and Saving

It is well documented that, on average, individuals underinvest in savings for retirement (Thaler and Sunstein 2008; OECD 2005). Of critical importance in much of the behavioural literature, when people are relatively young they make consumption choices that result in pensions too low to meet their income needs after retirement. This is often explained as a product of a lack of self-control or lack of foresight; little attention is paid to the possibility that relatively low levels of savings are driven by inadequate levels of income. Later in life, many people would like to save more, but they find it much too late to compensate for inadequate savings earlier and they regret the savings-related decisions they made when they were young. This contravenes the conventional economic wisdom that predicts that rational decision-makers will adequately save for their retirement, such as is reflected in the life-cycle hypothesis, presently a dominant economics view of real-world saving behaviour.

Many behavioural economists have argued that savings behaviour is largely determined by how saving options are framed to the potential saver. It is also well documented that if the default option for a savings plan is that one is enrolled automatically, the vast majority of employees enroll, and will therefore not choose to fill out the forms allowing them to opt out. If the default option is not to participate in a savings plan, the vast majority will not, and will therefore not choose to fill out the form to opt in (Thaler and Sunstein 2003; Benartzi and Thaler 2007). This suggests that individuals are easily and willingly manipulated or nudged into savings

behaviour that they will probably prefer to have later on in life. From the perspective of the Kahneman-Tversky approach to behavioural economics, changing the frame or default of a pension option is the ideal method of dealing with the irrational decision-making behaviour of the average individual. Financial education per se is not critically important in this instance in changing choice behaviour. What counts is the default option.

From the Simon-March bounded rationality perspective, the manner in which an option is framed provides rational individuals, in an uncertain world with imperfect information, with implicit data or signals about options. Changing the saving default option to saving signals that participating in a particular savings plan is the right and safe thing to do. It is therefore a moral imperative that if opting in is the default option, the state ensures that employees aren't unwittingly opting into high-risk savings plans. It is also important that employees are provided with reasonable opting-out mechanisms from possibly high-risk pension plans.

It also critical to note that changing the default option has the most success when employers or governments have provided funds, in some proportion, to match employee contributions. Changing the default, in itself, has often not been sufficient to flip employee decision-making in a dramatic manner. Therefore, it appears that incentives also play a critical role in changing savings behaviour. The relative role played by changing the default option remains a subject for future research.

Financial education can play a role in changing savings behaviour from the perspective of bounded rationality, but not by changing the behavioural traits of decision makers. Rather, by providing employees with improved information, it is possible that some employees will choose to invest more towards their retirement. Also, providing information on pension plan options can allow employees to better understand the risks involved in particular pension plans. But the evidence suggests that, on average, changing the default option, along with changing the economic incentives, is the most effective mechanism of changing savings behaviour.

An important study on financial literacy commissioned by the OECD (OECD 2005)

found that financial education can, indeed, make a substantive difference to savings behaviour (p. 57). This is most often the case when employers and financial advisors provide financial information that employees trust and present it in a manner that is easily understood. However, such advice is often provided by individuals who have a vested interest in encouraging employees to invest in particular pension plans. As a result, the advice is biased towards the advisors' preferred plans.

According to this same study, "Many consumers accept without question what their financial advisor recommends." (p. 46) This suggests that in a world of bounded rationality and, more specifically, when given highly complex information, combined with limited knowledge, limited time to assess and analyze that information, and uncertainty, individuals often fall back on heuristics when making financial decisions when there are faced with changes in defaults for saving and, more specifically, for pension options. For this reason, a critical aspect of financial education is for there to be third parties who can attest to the accuracy and integrity of the financial information provided and who can be involved in determining which pension options are set as the default. This is especially important if the default option, in an unregulated market, is for high-return, high-risk pension fund options, where the trust heuristic can result in losses that employees do not expect.

As a contemporary footnote to this discussion of investments in pension-fund-related financial assets, in the recent past leading financial rated agencies provided AAA credit ratings to very high-risk bundled assets, such as the Collateralized Debt Obligations (CDOs) that contained both safe and highly risky assets. This falsely signaled to consumers that these assets were judged to be safe by internationally renowned and trusted private sector rating agencies. In such a case, financial education and improved financial literacy could not have protected consumers or provided them with the means to make improved financial decisions when faced with misleading information that they trusted to be accurate. For rational decision-makers to make optimal decisions, the information at hand must also be as correct as possible (Lewis 2010; Posner 2009;

Roubini and Mihm 2010).

Investing in Financial Assets

Investment in financial assets over the business cycle and across significant booms and busts provides another excellent platform from which to assess how the different behavioural economics narratives speak to the ability of financial education to affect decision-making. Investment in financial assets highlights behaviours that are inconsistent with conventional benchmarks for rational decision-making. These aberrant behaviours include greed, overconfidence, herding, and passive trading, or the absence of true Bayesian updating (constant updating of decision making based on new information). The Kahneman and Tversky approach to behavioural economics seeks to discover means to overcome such behaviours. However, research into investor behaviour suggests that individuals who do not behave neoclassically are financially better off on average than those who perform based on conventional neoclassical prescriptions. This being said, it is important to determine the role financial education can play in improving financial decision-making by the average individual and, perhaps more poignantly, reducing the probability that the average individual will make disastrous investment decisions.

Karl-Erik Wärneryd (2001) finds that non-rational investors, from a neoclassical perspective, are typically more successful than relatively sophisticated (more neoclassically oriented) investors (p. 6). These would be passive or noise traders, who are often held responsible for fluctuations in financial markets and for crashes. They are interested in the long run and are not neoclassically calculating, but do relatively well in the long run.

Gerd Gigerenzer (2007) provides a concrete example of such behaviour in his analysis of the investment behavior of Harry Markowitz, 1990 Nobel Prize Laureate in economics (pp. 26-28). Markowitz, was awarded the Nobel Prize for his research on optimal asset allocation. He argues that there is an algorithm to compute an asset portfolio that maximizes returns while minimizing risk. However, when putting together his own investment package, Markowitz uses what Gigerenzer refers to as the 1/N rule, which tells us to spread our money equally across each

of the designated N funds. This is how most ordinary folk-type investors actually behave. These are the passive investors mentioned by Wärneryd. The $1/N$ heuristic actually outperforms the portfolios constructed using the optimal algorithms derived from economic theory. The complex algorithms outperform the $1/N$ asset allocation only over very long spans of time—50 assets distributed by the complex theory-based algorithm requires 500 years to outperform the $1/N$ rule asset distribution, so not in our or many lifetimes. As well, this and other heuristic-based investment portfolios typically outperform portfolios designed by major investment houses and fund managers.

The $1/N$ heuristic is a fast and frugal shortcut that jibes with the computational capacities of the human brain working within the realm of imperfect, asymmetric, and uncertain information. It also overrides short-run emotional considerations that drive an individual's investment decisions. This heuristic is not only a descriptor of individual behaviour; for some behavioural economists and economic psychologists it is also an optimal heuristic for investor behaviour if one isn't privy to insider information. One lesson from this type of analysis is that, for most people, passive investing strategies in a relatively diversified asset portfolio (such as is given by the $1/N$ rule) is optimal. Moreover, active investing (the neoclassical heuristic) is sub-optimal. Investing in a mutual fund, where trading is not aggressive, is a proxy to investing by the $1/N$ rule.

These findings sit quite nicely with the bounded rationality–satisficing approach to behavioural economics. In this instance financial education can play an important role in informing individuals about actual returns from different types of investment strategies. It can also provide information on the advantage of holding on to a diversified asset portfolio over the long term as asset prices, on average, tend to revert to the mean (the mean reversion hypothesis). One cannot expect the typical individual to have this information easily at hand in an easily comprehensible format.

An important question becomes who is best positioned to objectively provide such

information. One should not expect private investment houses or banks to provide neutral information and education in this area if higher profits can be made attracting investment into funds with active fund managers. As previously discussed, Shiller (2008, 2009, 2010) makes the case for legislating and subsidizing the provision of such information.

Bubbles and Busts: Animal Spirits and Decision-Making

Many behavioural economists have tied both bubbles and busts to emotionally driven (and therefore irrational or biased) heuristics motivating decision-making. This is exemplified in the most recent crash in financial markets. Greed, animal spirits (decision-making driven by psychological factors), irrational exuberance (pro-active investment behaviour not based on economic fundamentals), and overconfidence are considered to be the key culprits. (See, for example, Akerlof and Shiller 2009; Shefrin 2002.) Behavioural economists coming from the Kahneman-Tversky perspective might argue that efforts to mitigate these behavioural traits, through education for example, could reduce the severity of severe booms and busts in average financial asset prices. Furthermore, individuals might be expected to learn from past experience so as not to repeat past behaviour that results in severe economic losses. Thaler, a key proponent of the Kahneman-Tversky approach, is not convinced of the efficacy of financial education in this domain, as many of these behaviours are hard-wired. For this reason he is a strong proponent of nudging as a means of changing the way individuals make choices (Palmer 2008; Thaler and Sunstein 2008).

From the Simon-March approach as well, to the extent that greed, animal spirits, and exuberance are part and parcel of the evolved human animal, education would do little to modify decision making that is predicated upon these human characteristics. But such behaviours would not necessarily be deemed irrational. For example, individuals who wish to improve their material well-being can be expected to invest in financial assets that are rising in value and divest financial assets whose value is falling. This can be referred to as greed, but it is not at all clear that this behaviour is irrational, Wanting more rather than less, such as wanting higher instead of

lower returns from financial assets, would seem to be consistent with rational or intelligent behaviour.

How one decides to invest is often determined by animal spirits. Keynes (1936) refers to animal spirits as behavior that is motivated by emotive factors, as opposed to calculating or hard-core economic rationality demanded by conventional economics. He speculates :

Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as the result of animal spirits – a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities (pp. 161-162).

But animal spirits, although not calculating behaviour, is intuitive, based on a sense of what one expects to occur in the near future. It is a heuristic based on one's expectations in a world of uncertainty. Although not consistent with calculating behaviour, it is consistent with bounded rationality and satisficing. Nevertheless, animal spirits can serve to generate significant deviations from economic fundamentals.

Take the case when animal spirits are motivated by how other people behave or how one expects other people to behave on the market. In a world of uncertainty investors use proxies such as rumours or insights from experts to build their expectations. In this fashion, individuals follow the leader in their investment behaviour once these leaders are identified. This is an example of the recognition heuristic Gigerenzer identified. Thus, individuals make choices based on what appears to be quality information or signals in the immediate absence of anything better. This particular type of recognition heuristic is referred to as herding. Herding can generate cascades in financial asset prices that deviate quite significantly from the economic fundamentals of the economic assets represented by financial paper (Shiller 2001). Cascades can contribute to significant financial bubbles and busts in asset pricing. Is the application of this herding heuristic an example of irrational animal spirits or of irrational exuberance?

According to the Kahneman-Tversky perspective, this type of decision making is an example of irrationality because it runs contrary to behavioural norms of the conventional neoclassical wisdom. The solution here might be to convince people that herding behaviour is not the best strategy, and neither is the recognition heuristic or being influenced by rumours. But it is unlikely that people can be convinced of this when they operate in a world of bounded rationality. Such behaviour is, as mentioned above, individually rational, although it does, invariably in the long run, result in financial booms and busts. To put this another way, should people who want to make more money on their investments not invest in assets that are increasing in value, because they know that one day prices might fall? Would the counterfactual to this dilemma be that they should not invest in financial assets, including real estate or housing, when pricing are rising? Should this rule of thumb apply to financial advisors as well? Would this be rational? And is this what one would want financial education to propagate?

At this point, it is important to note that during financial asset price cascades individuals do not hold on to assets whose prices are falling relative to their fundamental values, nor do they dump assets whose prices are rising relative to their fundamental values. In other words, individuals do not behave as predicted by Kahneman-Tversky. Contrary to Kahneman-Tversky, many people are risk-averse in losses (they dump bad assets) and risk-seeking in gains (they hold on to relatively high priced assets for too long) when there is a credible leader or rumour to justify such behaviour. In fact, one cause for booms and busts is animal spirits as driven by herding behaviour, such that bad assets are dumped quickly and assets with increasing prices are held for too long in the sense that they are kept at least until a crash seems imminent—a situation that no one can in fact predict with any calculable and precise probability.

Richard Posner (2009), one the key proponents of the conventional economic wisdom but highly critical of economic theory's shortcomings with respect to the 2008-2009 economic crisis, argues that institutional failures were largely to blame for the financial meltdown, *as opposed to the irrationality of decision maker*—even though decision makers were acting contrary to

neoclassical first principles of decision making (p. 76). Thus, for example, greed, irrational optimism, intellectual deficiencies, or mistakes and errors in decision making are not the main causal culprits in economic collapse. Posner also argues that emotive variables, so stringently critiqued by the Kahneman-Tversky perspective as well as by the conventional neoclassical outlook, should not be regarded as indicative of irrational drivers in the decision-making process. Posner (2009) maintains that emotions represent telescoping thinking that is often “superior to conscious analytic procedures.” He also argues that buying at the peak and not selling at the trough of a cycle is not irrational since no one knows when the peak or trough occur in a world of uncertainty, and decision-making is like firing a shot in the dark. With uncertainty there is no strict mathematical basis for decision making. We base actions on our intuition of what we think makes the most sense. This behaviour is neither irrational nor subject to change by education if it is based on what decision makers perceive to be solid information (pp. 82-85).

Posner (2009) argues that herding behaviour is also quite rational since in a world of imperfect information someone else might know something that you do not. Following a supposedly informed individual might be in your best interest, and not following might turn out not to be in your best interest (p. 84). Here again, from Posner’s perspective, one cannot educate decision makers not to herd because herding is rational in a world of uncertainty, although herding invariably results in busts. Rational decision-makers can’t predict when bubbles will burst or when there will be a recovery in the real world of bounded rationality. So, in Simon’s methodological terminology, rational agents satisfice, they ride the tide and hope for the best while searching for easily identifiable and relatively trustworthy signals when engaging in financial decision-making.

Posner accepts that smart people can make errors when they make decisions. But these are errors that smart people can make and not the product of Kahneman-Tversky-type irrationalities. For Posner, institutional failure was the key reason that non-conventional (but smart) behavioural heuristics did not work in 2008-2009. Whether or not good or bad institutions are in place

depends on public policy. This analysis fits into the Simon-March approach to behavioural economics that emphasizes rational behaviour in a world of bounded rationality and the importance of institutional parameters affecting decision making. Therefore, many significant but problematic financial choices from a social perspective are better addressed through institutional change than through financial education.

Posner's point of focus is the incentive environment created for different levels for decision makers within financial institutions as well as consumers prior to the 2008-2009 financial crisis. This incentive environment minimized the risk or reduced the cost to rational individuals and large financial corporations of knowingly engaging in overly risky behaviour. Lewis (2010) makes a similar argument, as do Roubini and Mihm (2010). They argue that executive compensation was very generous and truncated on the downside, so that if you made decisions that yielded high profits in the short run but caused harm in the long run, you were protected by your compensation package. Executives were given incentives to make decisions that could have disastrous consequences for their company, their employees and society at large, because they were insulated from their own risky decision-making. This is a classic moral hazard environment that was created by financial corporations and encouraged by government. This moral hazard environment extended to lower-level decision-makers, such as investment brokers and advisors, who were also protected from the costs of poor decisions by their compensation packages.

Rational consumers in the United States were also induced into making investments in housing based on low interest rates, such that individuals with little or no collateral were willing to take out mortgages in the belief that interest rates would remain low. Neither buyers nor sellers envisioned significant risks from the moral hazard institutional environment. According to Posner, the downside of the housing market was truncated, "making [the buyer's and seller's] 'reckless' behavior not only rational but also consistent with [their] being well informed about the risks." (p, 104).

From this perspective, a misguided institutional environment is a more likely explanation of poor decision-making both from an individual and social perspective than is simple irrationality or even poor information (for example, Posner, p. 111). In this case, financial education cannot be expected to have much effect. You cannot educate people to behave differently if they are behaving as sensible individuals can be expected to behave in a world of bounded rationality. For example, you cannot teach people not to ride the tide, follow the herd, use their intuition, and take advantage of good deals when these are the best available options. Only after the fact can some of these heuristics be said to result in bad decisions.

Informational Problems and Errors in Decision Making

Even with correct incentives, informational problems can cause rational decision-makers to execute decisions that they would not otherwise engage in. Shiller (2008, 2009, 2010) emphasizes the significance of the informational environment to financial decision-making. Improvements to the quality of information, to access, and to understanding through education can be expected to at least mitigate many of the poor financial decisions made in the past. The role played by misleading information in decision making, all other things remaining the same, is particularly important.

For example, when assets receive a triple-A rating from respected rating agencies, consumers tend to trust this information and purchase what appears to be high-yielding, relatively low-risk assets. This is exactly what was happening in the global financial market before the 2008-2009 financial crisis. Financial assets that were a mix of high-grade and low-grade assets (a mix referred to as toxic assets) were given a clean bill of health. Consumers who used asset ratings as one input into the investment decision-making process may have been misled into making high risk investments that they would not have made had more accurate ratings been provided by trusted rating agencies. Moreover, had consumers purchased fewer financial assets in a different information environment, the market for these assets would have been smaller, altering the dynamics of global financial asset markets.

One problem inherent in the rating of financial assets is that the rating agencies are private and self-regulating institutions in a highly uncompetitive market (at best an oligopolistic market). There exists a conflict of interest between the rating agencies and the corporations whose financial products are being rated. It is possible that decision making could be improved with better, more accurate information and an improved understanding of the information at hand. But, as Shiller (2008, 2010) points out, past experience and the incentive environment suggest that such information is best provided within a regulatory framework, as is the case with food labels.

A similar type of scenario with regards to this type of information can be found in the mortgage market. It is not clear that purchasers of mortgages were made aware of the fine print relating to the structure of interest rates over the term of the mortgage in the American market. Many individuals do not read the fine print of financial documents or understand the complex language of the documents. Another common example of this is credit card arrangements, where interest rates can increase dramatically within a relatively short period after an individual signs up. Yet another example involving credit cards is the defaults established for increasing the maximum allowable expenditure. If the default is to increase the credit limit on demand, and consumers can be aware of this only after reading the details in fine print, they might be basing financial decisions on inadequate (imperfect) information.

The clear implication of these types of examples is that rational individuals can make choices that they will regret when faced with inadequate or false information. Improved financial decision-making can be achieved, therefore, when an impartial body, a government, for example, assures that consumers are provided with the information they require in a manner they can comprehend, together with the tools to better understand the financial information they are provided with. Under such a scenario, improved information yields improved financial literacy. And, it should be noted, providing quality assurance for the information and even for the defaults made available to consumers is a subset of consumer protection.

The Trust Heuristic

The trust heuristic is another non-conventional tool used by decision makers that is subject to critique by both the conventional and Kahneman-Tversky type perspectives as a form of irrational behaviour. As with other fast and frugal heuristics, emotional and intuitive drivers affect the trust heuristic. But trust has a long tradition of being used by decision makers. In the absence of legal guarantees, it provides a second-best substitute. In a world of legal guarantees with bounded rationality, the trust heuristic saves on transaction costs by allowing for speedy, effective, and efficient decisions (Greif 1989; Kohn 2008; Landa 1994, 2008).

Trust is the expectation that the other party to a transaction will deliver on promises made. This might be because the other party incorporate one's interests into her own. Also of importance is a sense that renegeing on a transaction would lead to economic consequences for the other party, either because of reputational harm or social or legal repercussions. But moral sentiments appear to be a key ingredient to trust relationships, with reputational, social, and legal variables adding strength to the mortar. Marek Kohn (2008) makes the following point about trust:

...cooperation may be initiated and sustained without trust. But once trust becomes possible it sustains interactions that would otherwise collapse, enhances the quality of cooperation, and threads the social fabric together. It is a prized sentiment whose absence is unthinkable in many contexts, and which is sought in contexts where reason might not find it to be strictly necessary. When our passions for a sentiment such as this run so high, our instincts are probably right. We value trust instinctively because it works for us, and has worked for our ancestors, in ways both familiar and beyond our grasp (pp. 38-39).

Important factors affecting trust relationships are the signifiers of trustworthiness that act as proxies for specific and detailed information on the trustworthiness of individuals. Among

these proxies are the ethnic, neighbourhood, religious and racial grouping with which one identifies. Many people believe they can trust those with whom they can more easily identify, those they think they know. This type of trust is enforced in an institutional environment where one has confidence that those breaking the bonds of trust will damage their reputations and result in legal and economic ramifications as well.

Ponzi Schemes and the Trust Heuristic

An enlightening example in the world of financial decision-making of the trust heuristic, and rational failures in the use of this heuristic, is the Bernard Madoff Ponzi scheme (LeBor 2009). This American-based scheme, the most notorious in international financial history, had repercussions throughout the world. Over four decades the scheme defrauded clients of over US\$40 billion. It was brought down in late 2008 when the global financial crisis led clients to attempt to cash in their assets beyond what Madoff's fund could sustain. Madoff's Ponzi scheme affected over a dozen Canadian companies and wealthy families. The Royal Bank of Canada reported that the exposure of some of its clients could reach \$50 million. And Canada's Mackenzie Financial Corporation had to halt redemptions in its Mackenzie Alternative Strategies once it was disclosed that about 20 per cent of its capital was invested in the Madoff Ponzi funds (Gray 2009). Canada has had its own share of Ponzi-type financial frauds, although nothing approaching the magnitude of the Madoff operation (CBC News 2009, Jones 2010, VanderKlippe 2009, Shecter 2010, Star Phoenix 2007).

A Ponzi scheme pretends to provide legitimate (but high) returns on investment, whereas it actually provides these returns by paying out from the capital provided by new and existing clients. As long as there is enough new capital flowing into the Ponzi fund and there are no excess calls on current investments, the Ponzi scheme is sustainable, with the orchestrator of the scheme typically reaping significant economic returns. People invest in such schemes because they trust in their legitimacy, and more specifically in the legitimacy and integrity of those owning and managing the fund. The high rate of return promised (and delivered on occasion) is

also important. One has the trust heuristic in play here, plus an economic incentive. Moreover, investors are not always aware that government does not guarantee their investments (at least their initial capital), as it does certain amounts of deposits held in banks. As a result, investors might engage in more risky behaviour than otherwise, believing that they are shifting the risk of their investment to government—another moral hazard dilemma.

Madoff was a well-established investor and player in American financial circles who had established a high level of trust in the international financial community. His fraudulent financial activities went undetected by the Securities and Exchange Commission, America's financial regulatory authority, in spite of early complaints laid against him and his investment house. Madoff was trusted by the regulators who believed that investors were capable of self-regulation. The fact that he passed the regulatory test earned Madoff an additional layer of trust by investors and provided some objective affirmation to the intuitive and emotive drivers underlying the trust heuristic. By all appearances, investors behaved rationally by investing in what they trusted to be a relatively low-risk, stable, and safe fund, yielding somewhat higher than average returns over the long term. But the trust that rational investors had placed in Madoff and in America's regulatory institutions was misplaced and eventually broken.

Should prospective investors be taught not to use the trust heuristic even though it has been part and parcel of common and relatively successful decision-making practices for millennia, albeit contrary to the conventional neoclassical wisdom's benchmarks for best-practice decision-making benchmarks? Would this avoid personal financial crises such as those caused by the Madoff Ponzi fraud? Would this keep consumers from investing in what they trusted to be highly-rated and relatively low risk financial paper?

The evolution of decision making makes it doubtful that this type of financial education would have had any effect. However, institutional change that provides consumers with vital and trustful information about financial assets they might want to purchase is another matter entirely (Shiller 2008, 2009, 2010). So would an education providing consumers with a better

understanding about the risks surrounding the purchase of different classes of financial assets. Related to this, investment advisors and brokers can be legislated to provide an easy-to-understand statement telling clients about the expected risks of investments and whether their proposed investments are underwritten by government. The latter is critically important, as it would clearly stipulate when individuals would have to bear the consequences of their risky behaviour on financial markets as opposed to transferring these costs to society at large. Finally, in extreme cases like that exemplified by the Madoff Ponzi scheme, regulatory frameworks need to be in place so that frauds can be more readily detected. As well, penalties for the architects of these frauds need to be severe and must be known and seen to be severe. Finally, with an appropriate level of financial literacy and regulation, there is a lesser probability that the bounds of trust would be broken, so the trust heuristic could be used in an optimal fashion.

Conclusion: Economic Theory, Financial Literacy and Public Policy

Different perspectives on behavioural economics yield different policy rules with regards to financial and financial literacy. These points are summarized in Table Two. The Kahneman-Tversky perspective is more oriented towards policies that nudge or force individuals to change their behaviour in ways consistent with what experts consider to be ideal choices. Financial education per se is not expected to have much effect in the face of the hard-wiring of decision-making heuristics that lead to poor financial choices. The Simon-March approach is much more optimistic about the impact of financial education on choice behaviour. But the availability and access to relevant and quality information, how information and option are framed, and the incentive environment within which decision making takes place are also important.

Table Two

Economic Theory and Public Policy

	Conventional Economic Theory	Behavioural Economics: Kahneman-Tversky, Errors and Biases Approach	Behavioural Economics: Simon, Bounded Rationality-Rational Individuals Approach
Savings / retirement planning	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). Individuals are assumed to behave in the ideal fashion, although some recognize that some ignorance might exist and be corrected for. 	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). • Education can be used to change the decision-making processes and choices towards the conventional economic ideal. • Requires individuals overriding their hard-wired psychological dispositions. • Changing defaults for investing in pensions. 	<ul style="list-style-type: none"> • Education (optimistic on outcomes). • Education provides the means for individuals to make intelligent choices based on their preferences, incentives and the information at hand. • Changing defaults for investing in pensions. • Transparency on the risks and returns of default pension funds. • Transparency on whether there is a lender of last resort.
Investing in financial assets	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). Individuals are assumed to behave in the ideal fashion, although some recognize that some ignorance might exist and be corrected for. 	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). • Education can be used to change the decision-making processes and choices towards the conventional economic ideal. • Requires individuals overriding their hard-wired psychological dispositions. 	<ul style="list-style-type: none"> • Education (optimistic on outcomes). • Education provides the means for individuals to make intelligent choices based on their preferences, incentives and the information at hand. • Transparency on the risks and returns of default pension funds. • Transparency on whether there is a lender of last resort • Reliable product labels for financial products.
Fraud and trust	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). Individuals are assumed to behave in the ideal fashion, although some recognize that some ignorance might exist and be corrected for. 	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). • Education can be used to change the decision-making processes and choices towards the conventional economic ideal. • Requires individuals overriding their hard-wired psychological dispositions. 	<ul style="list-style-type: none"> • Education (optimistic on outcomes). • Education provides the means for individuals to make intelligent choices based on their preferences, incentives and the information at hand. • Moral education to reduce fraud. • Improved transparency of financial transactions. • Well-resourced regulators to increase the probability of detecting financial fraud. • Severe financial penalties for those convicted of financial fraud so that marginal costs clearly outweigh marginal benefits.
Credit cards	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). Individuals are assumed to behave in the ideal fashion, although some recognize that some ignorance might exist and be corrected for. 	<ul style="list-style-type: none"> • Education (pessimistic on outcomes). • Education can be used to change the decision-making processes and choices towards the conventional economic ideal. • Requires individuals overriding their hard-wired psychological dispositions. 	<ul style="list-style-type: none"> • Education (optimistic on outcomes). • Education provides the means for individuals to make intelligent choices based on their preferences, incentives and the information at hand. • Reliable product labels for financial products. • Easily identifiable and understandable contract clauses. • Interest rate policy should be easily understood by consumer. • Credit card policy changes should be easily recognized and understood by customers. • Defaults for credit limits should be to the advantage of the customers. • Key credit card terms and conditions should be verbally conveyed to consumers.

I would argue, based on the evidence, that public policy is best constructed on the foundations of the Simon-March approach to behavioural economics. There is much evidence to support the view that financial education affects decision making. A person more educated on financial matters, such as concepts of risks, rates of return, credit card payments structures, and household budgeting, makes better decisions, at least from the perspective of the decision maker. Moreover, educating individuals to become more literate in numeracy should reduce errors in decision making. Financial education in this case is not directed towards changing human behaviour, such as overcoming biases as defined by the conventional wisdom. Rather it is directed towards helping individuals who are boundedly rational to make better decisions—decisions informed by more specialized knowledge about financial issues, markets, and products. Following Shiller, one might argue that financial education should be subsidized when it has positive social effects, such as improving savings behaviour and reducing the chances that poor budgeting and investment decisions will be made. But improved decision-making requires much more than just improvements to financial education.

Policy interventions directed towards improving the quality and quantity of pertinent information are critically important. This includes introducing quality control measures with regards to this information. The 2008-2009 financial crisis underscores the significance misleading information can have on investment behaviour. Echoing Shiller, agents and organizations marketing financial products, for example, should be obliged to clearly specify the risks and prospective returns involved in purchasing particular financial products. One might even go a step further and require the specification of the composition of financial products in terms of their components' risks and returns (for example, whether products that on average carry medium risk contain components that are very high risk). This is analogous to the requirements for nutrition and the content requirements for food labels. It should also be made clear whether the consumer bears the risk of the investment—whether government guarantees the value of the initial investment/purchase of the financial product. If individuals believe that government bears

the risk, it will be rational for them to engage in riskier behaviour than they would otherwise. One way of partially fixing this problem is to oblige vendors of financial products to inform consumers/clients of the risk inherent in these products and even to require both parties to sign a document specifying that the conditions of risks are understood.

It is also important to introduce baseline rules to assure that information is framed and presented in a manner easily understood by the consumer. For example, it should be made clear and easily evident what the penalties are for late payments on credit cards, what the longer term rate of interest is, and whether the default for the card is to approve purchases even if they extend the cardholder beyond the contractually agreed credit limit. Another example relates to pension plans. Many behavioural economists recommend making investing in pension plans managed by the private sector the default option to induce increased savings for retirement. Once investing in pensions becomes the default, employees tend to invest, using the default as a signal that such an investment is a good and safe one. For this reason, those setting the default should be obliged to specify the risks and prospective returns of such investments.

Once it is recognized that baseline rules for product information ought to be required, it becomes critical to define the level of financial literacy needed by the representative consumer and decision maker for whom these rules are constructed. Should the government consider the representative consumer to be an individual who is highly literate, or one who is just barely literate? I would argue that the representative consumer should be thought of as at the lower end of the scale since even the least financially literate individuals should be able to understand the financial information before them. It is these people who tend to make the most errors in financial decision-making. Increasing their level of financial literacy would provide these decision makers with the means with which to make the best use of the information at hand.

Finally, the Simon-March approach suggests that there is a need for interventions in the marketplace that will re-orient the incentive environment to ensure that individual investors bear the risks of their decisions. This is particularly important for key decision-makers in financial

institutions. I do not mean to suggest that people should or can be educated not to value their own material well-being. Rather, investors can be obliged to consider the riskiness of their choices and not allowed to shift their risk onto other unsuspecting people. This would require government to intervene in setting up the structure of compensation packages for decision makers in financial institutions, a move which may be problematic for many policymakers. But given the importance of the financial sector and the possible repercussions of a failure in this sector for the economy at large—namely forced government bailouts (which transfers all risks to the government and thus to the general public)—the sensible alternative may be to impose minimal regulations that minimize the possibility that investors will make choices that are deemed to be too risky. Such policy has been most recently recommended, for example, by Posner (2009) and Roubini and Mihm (2010). As well, moral education is important for financial transactions insofar as there is a need to reduce the probability of fraudulent transactions.

Behavioural economics also suggests that various types of experiments and surveys can be conducted to determine how consumers would behave under different sets of informational, educational (financial literacy), and institutional settings. One could also determine in this fashion differential behaviour among gender, ethnic and immigrant groups across Canada, and ascertain where financial education would have the greatest marginal effects. One example of this would be to run experiments on how decision making is affected by the structure of the information provided. Variables should include complexity, location of key information, and font size. Another example would be to see how decision making is affected by altering the moral hazard environment for people at different levels of financial literacy. It would be equally important to clarify the relative role of defaults, information, clarity of information, and incentives in affected financial decision making. One might also examine the extent to which formal financial education instruments improve the quality of financial decision-making when information is misleading, overly complex or hidden, or when defaults are set contrary to the preferences of consumers.

Overall, behavioural economics open the door to the improvement of decision making through financial education. They also lend support to the possibility that other public policy initiatives can enhance financial literacy and thereby improve the quality of financial decision-making without additional investment in traditional learning environments. The bounded rationality approach pays particular attention to how smart but non-neoclassical decision-makers are influenced by information and the incentive environment. Formal financial education courses and seminars are not as important here as are quantity, quality, and structure of information and its availability at low cost, as well as institutional parameters that affect financial decision-making. More formal education instruments are important with regards to enhancing the capacity of individuals to process and understand the information at hand. It is these factors combined, and not simply formal financial education instruments, that have the most profound impact on financial literacy.

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