Chapter 3

Can Behavioural Economics be used to make Financial Education more Effective?

by
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This chapter investigates the extent to which behavioural economics might explain some of the problematic financial behaviours that are observed amongst consumers, including low levels of retirement saving and high levels of credit use. It also asks how behavioural economics can help policy makers to improve financial education, from take-up to completion.

Various tools available to policy makers to help consumers overcome psychological constraints are discussed. These include supervision and regulation of financial services, and the design of default options.

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1. Introduction

Over the past few decades, trends in the financial markets as well as pension system reforms in many countries have expanded consumers' role in determining their own long-term economic security. At the same time, policy makers around the world have also become increasingly aware that many ordinary consumers are not necessarily able to shoulder this responsibility. Increasing financial literacy via financial education has long been regarded as the intuitive solution. Yet, the actual impact of various financial education programmes on knowledge and behaviour has only recently begun to be rigorously studied. The mixed results to date clearly suggest that successful financial education is a challenge not to be taken lightly.

Drawing on psychology and cognitive science, the rapidly growing field of behavioural economics suggests that financial decision making, as well as other types of behaviour, may be driven by systematic biases and heuristics beyond the scope of purely rational decision making. For policy makers, behavioural economics offers a new perspective on individual decision making and consumer protection, and increasingly features as a topic of dialogues around the world.

The goal of this chapter is to explore ways in which insights from the emerging field of behavioural economics can make financial education more effective. Sections 2 and 3 provide a relatively brief and non-technical selective review on financial education and behavioural economics to draw together much of the important work related to topics of household finance. Sections 4 and 5 discuss approaches to applying behavioural economics to the development and implementation of financial education programmes, as well as other policy tools related to consumer protection that complement financial education. Section 6 concludes.

Scope and Definitions

As a note to the reader, this chapter will focus on household financial decisions. Related topics such as entrepreneurship and business education are of significant interest but fall outside the scope of this discussion. In addition, it largely draws on evidence and experiences from OECD member countries, but also refers to other international settings when appropriate.

For the purposes of this chapter, it is useful to explicitly define certain terms that will be used throughout. As in OECD (2005), we define *financial education* as the process by which financial consumers improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being. In this context, *information* involves providing consumers with facts, data and specific knowledge to make them aware of financial opportunities. *Instruction* involves ensuring that individuals acquire the skills and ability to understand financial terms and concepts through the provision of training and guidance. *Advice* involves providing consumers with counsel about generic financial issues and product so that they can make the best use of the financial information and instruction that they have received. We also define a *financial education programme* as a project or service (or a related collection of projects and services) that is systematically structured with the intention of meeting specific financial education goals.

We define *consumer protection* as overlapping with but distinct from financial education. The emphasis of consumer protection is legislation and regulation to enforce information disclosure and standards of practice by financial institutions (that may include financial education), as well as mechanisms for consumer complaint and redress in the case of unfair, deceptive or fraudulent practices.

2. Background and context

Why is financial education potentially so important?

When compared to several decades ago, the financial environment for the average consumer today offers more opportunities for the individual to control his or her own finances. As a result of improved technology and financial innovation, consumers have experienced an unprecedented expansion of access to a growing array of sophisticated products and services (Dynan, 2009). However, the complexity of the financial marketplace has introduced new pitfalls for the investor as well as greater potential for financial fraud and mismanagement. At the same time, there has been a transfer of financial responsibility away from states and firms towards households, firstly through the decline of public welfare policies and corporate social programmes, and secondly through the shift from defined-benefit to defined-contribution public and private pension schemes (OECD, 2005). The burden on households is even more significant in the light of growing life expectancy and long-term health care costs. Finally, these trends have distributional implications: if only the wealthy and well-educated have the financial skills to take advantage of these changes, the poor may disproportionately lose more than they gain, exacerbating existing inequalities in wealth and well-being.

Given these challenges, consumers' ability to make intelligent and responsible short and long-term financial decisions is more critical than ever. Financial education that effectively supports this ability has potential benefits for multiple stakeholders. For consumers, there is strong evidence that links more financial literacy to welfare-improving behaviour - more planning, more appropriate use of credit, more successful wealth accumulation lead to more successful financial well-being, which in turn is linked to greater long-term overall well-being. For the financial services industry, more participation and better-informed participants would increase demand for financial products, build competitiveness, promote market transparency and increase efficiency. Policy makers would benefit from a lighter regulatory and supervisory burden related to monitoring, intervention and redress in financial markets as well as a more successful environment for reforms. For the economy as a whole, more financially-secure households with higher savings rates should contribute to better-functioning markets, increased economic stability and development and a reduced need for future public expenditures.

Financial literacy among OECD member countries

An increasing number of countries have completed or are currently in the process of implementing financial literacy or capability surveys, helping policy makers to assess the baseline need for financial education at a population level. In 2005, the OECD (2005) first reviewed the surveys in 12 of its member countries. Since then, a number of new national surveys have been conducted and in October 2008, the OECD established the Financial Literacy Measurement Sub-group to address the need for internationally comparable survey data on financial literacy and capability. Over time, a surprising number of common policy-relevant themes have emerged

Firstly, a significant fraction of consumers have a limited objective understanding of financial issues or financial capability. For instance, in the recent 2009 United States National Study of Financial Capability, less than 10% of respondents were able to answer three simple questions about compound interest, inflation and risk diversification correctly (FINRA, 2009, Lusardi, 2010). In the United Kingdom, more than 60% of respondents were identified as having at least one area of weakness related to financial capability (Atkinson et al, 2006)

Secondly, at the same time, many consumers may still be overly confident about their ability to manage their finances: in a typical example, in the same 2009 United States Financial Capability

survey, almost 40% of individuals rated their knowledge as high or very high. This high self-ranking is consistent with findings from other surveys, but incompatible with the measured level of financial literacy (Lusardi, 2010). Similarly, in the Netherlands, almost 15% of individuals had poor financial knowledge but report that they have no need for extra information about financial matters (Cent1Q, 2007)

Finally, important patterns of intra-national disparity in financial literacy exist. Financial literacy is consistently correlated with education and income: the surveys persistently show that those with lower income and education exhibited the least knowledge.

Although very general, these findings clearly suggest a need for financial education. Importantly, they also draw attention to the need for design that goes beyond the simple presentation of facts and figures. Programmes need to take into account the requirements, interests and baseline skills of different target populations in mind in order to engage and motivate the consumer, while maintaining a delicate balance between increasing self-efficacy and creating potentially harmful overconfidence. In the implementation of any given programme, these and other challenges have not been easy to overcome, as the next section illustrates.

Financial Education in the OECD and beyond

Many governments and supervisory authorities in the OECD have a statutory objective of promoting public understanding of financial products and markets, with financial education as a central part of their efforts. For example, in the UK, the Financial Services Authority launched a programme called "Building Financial Capability" in 2003, headed by a public-private steering committee to improve overall financial education. In the United States, The Department of the Treasury established the Office of Financial Education in 2002 to promote access to financial education tools. It also coordinates the efforts of the Financial Literacy and Education Commission, a group composed of representatives from 20 federal departments, agencies and commissions. In Japan, France and the Netherlands, committees that bridge both the public and private sector have also been formed to provide national-level guidance on financial education (OECD, 2008).

Training consumers in financial matters is by no means new or unpopular, as shown by the large number of existing financial education programmes conducted by schools, employers, governments and other organisations. In its first major international survey of financial education programmes, the OECD (2005) found that three key subject areas stand out (and will be the focus of many of our examples to follow):

Firstly, given the shift towards defined-contribution plans and pension reform in many countries, programmes related to *savings and investment* for retirement are increasingly important. These primarily consist of education programmes provided by the public sector or consumer advocates as well as public education campaigns to encourage saving.

Secondly, the number of consumers in the OECD with mortgage credit has increased primarily as a result of low interest rates, rising house prices and deregulation. Credit card usage has also grown substantially over the last several decades mainly as a result of product innovation. In response to the increase in household debt, programmes focused on *credit and debt* have also increased in the last few decades. These include both preventive credit-management education as well as programmes targeted at consumers in need of credit repair.

Thirdly, as financial markets gain in sophistication, a surprisingly large proportion of consumers remain excluded from the financial mainstream. For instance, in 2009, approximately 25% of the

population in the United States were "unbanked" or "underbanked", i.e. either having to rely on alternative financial services or lacking a bank account altogether. The poor, less-educated and certain minorities are disproportionately represented among this group (FDIC, 2009). While large financial institutions are often not aggressive in marketing to such consumers, lack of understanding of how to obtain an account and the benefits of having an account also form an important barrier to participation. A number of programmes focus on *financial inclusion*, in order to help the poor increase their savings and avoid expensive and sometimes exploitative alternative financial services.

In the period following this initial survey, financial literacy programmes have continued to grow and evolve. In 2007, a survey of the EU27 member states by the consulting firm Evers and Jung found over 150 financial literacy initiatives, with an increasing focus on the use of internet delivery (Habschick et al, 2007). In 2008, the OECD (2008) released a study reviewing financial education programmes related to insurance and private pensions that also reflected an expansion among member countries as well as more use of websites and internet tools. In the wake of the financial crisis, several countries have intensified existing programmes, or instituted new ones, to address the adverse effects on households.

However, the substantial variance in the specific form, content and delivery of these programmes emphasises the fact that while the concept and topics may be general, financial education itself far from being a generic intervention. Most of the (non-school based) programmes reviewed relied on traditional print media and the internet as primary forms of dissemination. More costly methods such as face-to-face interaction were less frequently used, depending on the context: for instance, programmes that target the unbanked primarily rely on training courses and less frequently on internet delivery.

Despite this seeming abundance and diversity, critics argue that no strong evidence exists to show the effectiveness of financial education. Seminal studies in the early research literature on financial education in schools and workplaces found positive and statistically significant effects on individual financial behaviour (Bayer et al. (2009); Bernheim et al. (2001, 2003)).

However, as evaluation has become more widespread, the evidence base has grown to include results from a growing number of different programmes. The sum of findings to date is also decidedly more mixed. There is much support for the view that financial education programmes can positively affect financial knowledge and expressed intent to adopt desirable financial behaviour (see for instance, Braunstein and Welch (2002) and Martin (2007) for a general review of findings drawn from the United States). In a related but separate literature, multiple studies have convincingly linked financial knowledge to such behaviour (Lusardi and Mitchell, 2007, 2009; Lusardi, 2008; Lusardi and Tufano, 2009; van Rooij et al, 2009).

However, few studies have been able to actively demonstrate a compelling and direct relationship between financial education and behavioural change. The evaluation of a retirement savings seminar by Clark et al. (2006) is an illustrative example: while respondents reported changing goals and intentions to save immediately after the seminar, a follow-up survey found only weak links between these intentions and actual changes. In addition, even when effects are present, their magnitude may be relatively small compared to estimates of the effect size from other factors, such as peer effects (Duflo and Saez, 2003) or psychological responses to features of the choice environment (to be discussed in Section 3).

In the absence of unambiguous supporting evidence in favour of financial education, some have argued that financial education does not "work", advocating instead more paternalistic interventions. More emphatic critics further argue that financial education may even be counterproductive, as false confidence or feelings of guilt generated by programmes may themselves be detrimental (Willis, 2008).

The current lack of conclusive results may partly be attributed both to the variety of programmes as well as the state of systematic evaluation. Firstly, the chain of relationships linking education and behavioural change is complex, involving a progression that is not necessarily linear from education to knowledge and motivation, intentions, and finally actual behavioural change. Many programmes are designed with fairly modest aims of addressing only one part of this chain, and expectations for individual programmes should therefore be benchmarked against their intended scope (Lyons et al., 2006). Lusardi (2008b) notes that it is hardly surprising to find that one retirement seminar does little to change behaviour, or that widespread financial illiteracy cannot be cured by a one-time benefit fair; whereas evidence shows that programmes with a sustained series of education sessions can be effective in stimulating saving. Secondly, true impact evaluation is still often not performed, particularly in circumstances where either the scope or the budget of the programme is limited. Very often, managers lack the financial and human resources to track behavioural change or even to rigorously measure skills acquisition, and are able to at best monitor delivery outcomes or customer satisfaction (Lyons et al. 2006). At this stage, rigorous large-scale meta-analysis of interventions across programme types and settings remains largely infeasible.

Indeed, given that financial education is not a generic intervention, the question of whether financial education as a whole works or not is inherently ill-posed. Like many other policy instruments, financial education should not be regarded as a silver bullet, and much depends on the specifics of each programme. When poorly implemented, it can be wasteful, ineffectual or even counterproductive; however, in many settings, it is appropriate and useful. As a practical matter, the overwhelming concern for many policy makers and practitioners relates to what works best: when financial education is part of an overall solution, how can it be made most effective?

3. Behavioural economics and personal finance

Under the standard assumptions of economic theory, decision makers are perfectly rational and able to fully utilise all the information available. They make optimal choices that maximise the expected value of their private utility, based on preferences that are consistent across time and independent of context. While these assumptions are far from approaching the reality of everyday human beings, economists have long argued that they were never meant to do so - rather, they provide mathematically tractable and empirically reasonable approximations for the modelling and analysis of actual behaviour.

A growing body of evidence across multiple domains of observed behaviour, however, suggests that this rationale does not always hold true - we find systematic biases and anomalies as well as common decision making heuristics that contradict the predictions of models populated solely by *homo economicus*. The emerging field of behavioural economics draws on insights from psychology and cognitive scientists to study aspects of behaviour in various market settings that deviate from these standard assumptions.

In this section, we provide a review of key concepts and terms currently used in behavioural economics. For clarity and structure, we employ the taxonomy used by DellaVigna (2009), who considers three broad categories of anomalies or deviations from the standard model, namely non-standard preferences, non-standard beliefs and non-standard decision making processes. In each case, we provide illustrative (but certainly not exhaustive) examples from the empirical research literature relevant to personal finance (specifically, money management and household expenses; consumer credit; real estate; savings and investments; insurance and annuitisation), drawing as far as possible on research based on demonstrations in the field rather than the laboratory.

Nonstandard Preferences

Time inconsistency

As a first point of departure from the standard model, consider that individual preferences may not be stable, but instead change over time - for instance, the same person may have different short- and long-run discount rates. Such *time-inconsistency* implies that this decision maker will have different preferences over the same future plan at different points in time.

A particularly familiar form of this phenomenon is *hyperbolic discounting*, or the tendency to discount the future more steeply in the immediate rather than the distant future (Laibson,1997; O'Donoghue and Rabin,1999). This can result in present-bias and problems with self-control, especially when presented with a course of action with large delayed benefits but small short-term costs. Hyperbolic discounters may sincerely wish to achieve certain long-term welfare-improving goals (becoming a regular at the gym, losing weight on a steady diet or keeping to a budget), but constantly risk being overwhelmed by the need for immediate gratification.

Individuals who are aware of their own proclivities may seek out commitment devices to constrain their future selves (Laibson, 1997). On the other hand, naive present-biased individuals are likely to overestimate their ability to resist temptation and underestimate their own inertia, leading to procrastination over unpleasant decisions (O'Donoghue and Rabin, 2001).

Models that incorporate time-inconsistency, self-control problems and procrastination can explain many undesirable aspects of financial behaviour, particularly in the context of saving for retirement. Self-control problems provide an intuitively appealing explanation for persistent individual undersaving (Laibson et. al. 1998). Such models can also explain more complicated puzzles. For instance, households in the United States tend to incur high-interest credit-card borrowing while simultaneously accumulating low-returning retirement assets. Laibson et al. (2007) suggest that individuals' short-term impatience leads them tend to spend liquid assets and use credit cards, but they then knowingly commit themselves to building long-term wealth by investing in illiquid assets.

Saving for retirement. A strong implication of time-inconsistency is that relatively small transaction costs or burdensome paperwork can be a real barrier to action, including participation in retirement savings plans (Choi et al. 2002). In the United States, Madrian and Shea (2001) find that an individual's participation and allocation of contributions is highly sensitive to enrolment defaults. Subsequent research by Choi, Laibson, Madrian, and Metrick (2004) shows that individuals consistently follow the path of least resistance and/or procrastinate when making such decisions. Cronqvist and Taylor (2004) find similar evidence for the default effect in Sweden.

Credit and Borrowing. Individuals who have self-control problems may also be particularly susceptible to over borrowing, whether from mainstream providers or alternative financial providers. Meier and Sprenger (2010), for instance, show that present-bias is positively related to increased credit-card borrowing. Individuals' naivete about their problems may further compound poor credit management. Earlier research by Ausubel (1999) shows that people will choose a credit card with lower short term "teaser" interest rates and higher long-term rates over the opposite, as they naively believe that they will not borrow much on a credit card, past the teaser period. Skiba and Tobacman (2008) examine default data from a payday lender in the United States and finds that the average defaulter has already repaid 90% of their original loan principal. This finding suggests that payday loan customers borrow in the short-term expecting to borrow less in the future. However, instead of rationally defaulting earlier to avoid paying the large interest costs of the loan, they then procrastinate on defaulting, which can have monetary, time or stigma costs.

Reference-dependence

Another departure from the standard model relates to reference-dependence, or the perception of value in relative rather than in absolute terms. When this is the case, the presentation or framing of choices becomes critically important, as preferences may be reversed when the same problem is framed in different ways.

In prospect theory, Kahneman and Tversky (1979) suggest that individuals derive utility from wealth based on differences from a given reference point rather than its absolute value. In particular, individuals tend to view gains and losses differently: those who are *loss-averse* weight the negative utility of losses more than the positive utility from the same amount of gain. A related manifestation of reference-dependence is the *endowment effect* (Kahneman et al, 1991), which leads individuals to value of objects that they are endowed more than their actual willingness to pay for the same object. In combination, loss aversion and the endowment effect can result in *status quo bias,* or an inherent preference for one's current state.

Another form of reference-dependence is as follows: in standard economic models, individuals evaluate decisions in the context of all other decisions that they face, and the utility of a particular decision is derived only indirectly via its impact on total wealth. *Narrow framing* refers to the tendency to treat the outcome of decisions in isolation. Thaler (1985, 1999) and Shefrin (1988) describe a series of cognitive processes that embody reference-dependence called *mental accounting*: individuals organise, evaluate and keep track of financial activities in a manner analogous to real accounting systems. Sources and uses of funds tend to be grouped using categories (housing, food, etc) with implicit or explicit budgets, and balancing of these "mental accounts" may take place at particular intervals.

Loss Aversion in the Housing Market. In a study of the housing market in Boston, Genesove and Mayer (2001) find that sellers tend to be loss averse. Their purchase price is a highly-salient reference point, resulting in list prices for units that are too high for units predicted to sell at a loss.

Selling Winners and Holding Losers. The trading behaviour of individual investors in the stock market is consistent with loss-aversion, generating anomalies such as the *disposition effect:* investors who find it unpleasant to realise losses have a tendency to sell winners and hold on to losing stocks (e.g. Grinblatt, 2001, Shefrin,1985, Odean 1998; Barber, Odean and Zhu (2009)).

Myopic Loss Aversion in the Stock Market. When investors are loss averse and also tend to evaluate their portfolios very frequently, this combination can lead to an excessive tendency to avoid taking risks, or myopic loss aversion (Thaler et al 1997, Gneezy, Kapteyn and Potters, 2003). Myopia, in this context, refers to an inappropriate treatment of the time dimension. For example, bad news from one day to the next ("the market value of an investment fell since yesterday") is treated in the same way as bad news referring to a longer period ("the market value of an investment fell since last year"). Benartzi et al. (1997), Gneezy and Potters (1997) and Gneezy, et al. (2003) show that, for investors in the U.S. and Holland, the more frequently investors receive information, the more risk averse they become. Investors who are myopic may sell out of risky assets too quickly in a downturn and buy back in too late in a recovery, resulting in permanent losses that could have been avoided by a longer-term perspective. Benartzi and Thaler (1995) posit that the large premium required by investors with myopic loss aversion may be able to account for the equity premium puzzle.

Overinsuring Small Risks. Loss aversion can have important implications in an insurance setting. Consumers who are loss averse may overinsure small risks, where the expected value of the loss is small relative to the cost of the insurance (e.g. mobile telephone equipment insurance, or insurance

bundled with ticket sales that covers cancellation of the event). Sydnor (forthcoming) shows that the premiums paid for such insurance schemes are puzzling in the context of the standard model but can be explained by a combination of loss aversion and overweighting of loss probabilities.

Narrow Framing in the Stock Market. One form of narrow framing is the tendency to treat new gambles and other risky decisions as if utility comes directly from the gamble itself, rather than considering the gamble in the context of all other risks currently faced by the individual. In the stock market, Barberis, Huang and Thaler (2006) find that investors with a diversified portfolio appear to derive utility from the fluctuations in their stock investments, independent of the overall fluctuation of their entire wealth portfolio.

Mental Accounting in Household Financial Planning. In overall financial management and planning, when households have multiple financial accounts, funds are often not "fungible" even within households or individuals. In the context of retirement savings plans in the United States, Card and Ransom (2007) find that individuals treat their own savings and employer or government contributions as if they are coming from different mental accounts. Choi et al. (2009) show that individuals tend to make decisions about one investment account without considering the allocations in their other accounts. As a result, framing matters: Benartzi and Thaler (2002) find that the choice of retirement savings portfolios varies significantly when portfolio choices are re-framed in terms of ultimate outcomes (i.e. projected retirement income).

Saving Out of Tax Refunds. Lump-sum transfers may be easier to save because individuals account for these funds differently from regular income flows, seeing them as surplus or bonus funds that can be saved (Shefrin and Thaler, 1988; Thaler, 1994). Research on the uses of refunds from the Earned Income Tax Credit in the United States has found that many recipients either save a portion of their refund or use refund dollars to purchase relatively expensive durable goods such as appliances or autos (Tufano and Schneider, 2008)

Framing and the Demand for Annuitisation. While rational models of risk-averse consumers have difficulty explaining limited annuity demand, Brown (2007) and Brown et al (2008) propose an alternative view based on framing. When consumers think in terms of consumption, annuities are seen as valuable insurance, whereas when consumers think in terms of investment risk and return, the annuity is perceived as a risky asset because the payoff depends on an uncertain date of death. Brown et al (2008) show individuals prefer an annuity over alternative products when the question is framed in terms of consumption, but the reverse is true when information is presented in terms of risk and return.

Social preferences

Preferences can also be defined over interactions with others in several ways. Researchers have found that the savings and investment decisions of community members and peers have a causal effect on individual savings and investment decisions, through direct social interactions such as straightforward word of mouth or learning by observation (e.g. Brown et al, 2008c; Duflo and Saez, 2003; Grinblatt, 2001b; Hong et al, 2004). In addition, direct or indirect social pressure (such as the implicit desire for conformity, acceptability and social identity) can powerfully affect decision making (Bikhchandani et al, 1998). In a striking experiment, Benjamin et al (2010) find that when ethnic identity is salient, people tend to conform to ethnic types when making risky choices. Finally, individuals may also have strong preferences over socially-defined values such as altruism, reciprocity and inequity. For instance, altruistic individuals may derive utility - the warm glow effect - directly from the utility of others (see Fehr and Schmidt (2006) for a detailed review of this literature).

Social interactions in stock market investing. In investing, effects of social interactions have been found in remarkably varied settings. Hong, Kubik and Stein (2005) find that U.S. households with high social interactions more likely to invest in the stock market than non-social households. Brown et al (2008) also show a causal relation between an individual's stock ownership and average community stock market participation (and further show that the results are stronger in more sociable communities). Using data from 10 European countries, Christelis, Jappelli and Padula (2005) find that social interactions significantly affect stockownership (especially in Mediterranean countries). In China, Ng and Wu (2006) also document strong word of mouth effects in trading decisions.

Taxpayer Compliance. The behavioural aspects of tax paying behaviour are not well understood, but studies suggest that factors internal to taxpayers such as social values may be key drivers of compliance (IRS, 2009). Increasing efforts on the part of agencies such as Her Majesty's Revenue and Customs (HMRC) and the United States Internal Revenue Service (IRS) are focusing on research exploring the consumer perspective, including the importance of these behavioural factors.

Charitable giving. Della Vigna et al. (2010) study the relative roles of social pressure and altruism in the context of charitable giving. They find that early notification about a door-to-door fundraising drive and the provision of a "do not disturb" option results in a significant reduction of household willingness to entertain fundraisers and the amount of donations respectively, and conclude that social pressure is an important determinant of charitable giving.

Non-standard beliefs

Overconfidence and over-optimism

Two aspects of overconfidence are particularly relevant to household finance: overconfidence about one's own inherent ability and over-optimism about the environment. In the first case, we observe that individual self-assessment generally tends towards overestimation about ones own abilities. A classic demonstration comes from Svenson (1981), who finds that when asked to rate their own skills, 80% of all drivers consider themselves in the top 30% of the population. Many financial literacy surveys, as discussed previously, display this trend towards overconfidence. DellaVigna and Malmendier (2004, 2006) show that consumers who are overconfident about their ability to maintain certain behaviours may be more susceptible to exploitation. In the second case, individuals also tend to be overconfident about their environment. In particular, they tend to consistently underestimate the probability of negative events across multiple domains (e.g. natural disasters, hospitalisation or falls in stock prices (Barberis and Thaler,2003)) Both types of overconfidence can lead to excessive risk-taking or other mistaken decisions (Camerer and Lovallo, 1996).

Overconfidence in ability to trade in the stock market. Investors may be overconfident in their own abilities, and hence tend to trade overly aggressively, which can eventually lead to portfolio losses (e.g. Odean, 1998; Barber and Odean 2001, Grinblatt 2009, Barber et al 2009). Notably, overconfidence in this setting is associated with gender: the Barber and Odean (2001) study found that, all else equal, men traded almost 50% more than women, driving up their transaction costs and lowering their returns. Recent data from the field provides some support for this finding: data on almost 3 million Vanguard investors shows that during the stock market crisis of 2008 and 2009, men were 10% more likely to abandon stocks than women (potentially implying that men were more likely to have taken losses and missed the markets initial rally) (Ameriks et al, 2009).

Overconfidence in employers and advisors. Overconfidence about the abilities or motives of others can also be detrimental. For instance, when investing as individuals, Benartzi, Thaler, Utkus and Sunstein (2007) show that employees tend to be overconfident about the performance of their

employer, which can lead them to hold a large percentage of savings in their employers stock or stock options which has negative implications for overall household risk diversification (Oyer and Schaefer 2005, Cowgill et al., 2008). Malmendier and Shanthikumar (2007) show that small investors are more naive about incentives than large institutional investors: they tend to respond literally to security analyst recommendations, while large investors tend to discount stock recommendations from potentially biased sources.

Overoptimism about insurance needs. Research shows that in many countries, homeowners are not sufficiently against disaster risk. In addition to underestimating the probability of such events, households often underestimate damages caused or needs for resources stemming from potential disasters and thus their coverage needs, in particular, those related to large-scale catastrophes or ageing risks. This is often compounded by a general but potentially unfounded conviction that other entities such as the Government already covers the risk or will eventually cover damages (for example, in the event of natural disasters or terrorist attacks) – the so-called "Samaritan dilemma" (OECD, 2008).

Non-standard probabilistic thinking

Researchers in psychology and decision science have shown that individuals have difficulty formulating accurate beliefs about risk, particularly in the form of numerical probabilities. One common tendency is to overweight immediately-available information and to draw false conclusions about how accurately that information represents the underlying reality. *Availability* and *representativeness* heuristics can manifest in many ways. "*Gamblers fallacy*" is the belief that the next draw of a signal will be different from the previous one: for instance, roulette players may bet on red after observing a string of black squares come up; or individuals with two boy children may suppose that the next time, they are more likely to have a girl. In either case, however, the probability of either one of the two outcomes is equal and independent with every draw. The somewhat opposite manifestation is *over-inferenc*e or the belief that a sequence of signals is likely to mean the next signal is of the same type.

Overinference about past stock returns. When investing in the stock market, naive investors may tend to place too much weight on past performance, consistent with the expectation that past high returns from an investment results in high future performance and vice versa. Multiple studies demonstrate that investors tend to over-extrapolate based on past performance (e.g., Benartzi, 1995; DeBondt and Thaler 1985). Overinferring the value of strong past performance of stocks can result in investment decisions in portfolios that perform worse than average because they are skewed towards stocks that are overpriced and will therefore under-perform (De Bondt and Thaler 1985). While in some contexts past performance may be informative (such as actively-managed investment funds), Choi et al (2010) show that even when comparing essentially identical index funds, individuals are sensitive to information about past returns since inception.

Inappropriate insurance purchasing behaviour. Alternatively, individuals who do not observe certain events such as earthquakes or accidents may form unrealistically high expectations that such an event will not happen. On the other hand, when personally exposed to rare events, many individuals tend to then overestimate the probability of such an event happening. Insurance purchasing behaviour tends to display some of these biases. For example, the 9/11 attacks increased awareness of the risk of terrorism in OECD countries and of the need to develop adequate coverage, and sales of all types of protection insurance increased in the two years afterwards (OECD, 2008).

Over-participation in lotteries. Lotteries are attractive to many individuals who have a tendency to overweight small probabilities. The appeal of a potentially large expected future payoff in this case for a relatively small outlay can also be influenced by the combination of myopic decision making and the underweighting of small dollar amounts (Haisley et al., 2008a).

Non-standard decision-making

Although individuals may have preferences or beliefs that are consistent with the standard economic models, their observed behaviour may still diverge if their actual decision-making processes depart considerably from rational utility maximisation.

Limited Attention

One important hypothesis is that attention itself may be a scarce resource: individuals fundamentally may not have the cognitive capacity to process all the information in their environment simultaneously. Limited attention can lead to decision making that is disproportionately affected by the saliency and recency of information and stimuli. Limited attention can also affect the selective filtering of information, due to confirmatory bias, or the tendency to gather and retain information that reinforces already-held priors (Mullainathan and Shleifer, 2005). It implies that individuals compensate for their processing constraints by adopting simplifying heuristics or cognitive "rules of thumb" for managing complex information or problems.

Limited attention also means that providing helpful information to consumers is not always straightforward: when the limits of cognitive capacity are reached, individuals may be susceptible to information overload. Too much information in this case may lead to a worsening of cognitive performance on specific tasks and feelings of stress. Finally, in the extreme case when individuals are faced with a choice that is perceived as too complicated, they may simply default to choice avoidance, or the decision to refrain from choosing any option at all. In other words, too much information, too many choices or a badly designed choice architecture may thwart choice altogether.

Limited Awareness of Financial Product Fees and Expenses. The average consumer of financial products reports being unfamiliar with fees and expenses, even with respect to his or her own portfolio (Dominitz, Hung and Yoong, 2009). However, over the long-term, even small fees can significantly erode long-term value. Barber, Odean and Zheng (2005) find that mutual fund purchases are sensitive to salient fees, such as front-end loads and brokerage commissions but are insensitive to less salient charges such as expense ratios. The saliency effect also plays a role in credit card fee payments (Agarwal et al. 2008). Some credit card users do in fact learn to lower their fees the longer they own credit cards, but this effect is offset by the tendency to forget fees. A late payment charge from the previous month is much more influential than the same payment from one year prior.

Limited Awareness of Taxes. The National Tax Advocate Annual Report 2009 for the United States notes that the complexity of the United States tax code is the most serious problem facing taxpayers and the United States Internal Revenue Service (IRS) alike. U.S. taxpayers and businesses spend about 7.6 billion hours a year complying with the filing requirements of the Internal Revenue Code, effectively making the "tax industry" one of the largest industries in the United States (IRS, 2009). Ignorance of the correct tax implications of their economic activities or confusion regarding tax returns may result in suboptimal withholding and investments, and delays or avoidance of filing altogether. As a further result of this complexity, many individuals may not be sensitive to tax incentives and penalties when making financial decisions. Barber and Odean (2004) find that while investors do show some response to tax incentives, many investors fail to employ fully tax-optimal strategies. Similarly, Chetty et al (2009) show that in the context of sales taxes, consumers are not usually attentive to non-salient taxation: firstly, posting tax-inclusive price tags reduces demand and secondly, taxes included in posted prices reduce demand more than taxes applied at the point of purchase.

Limited Investor Attention in the Stock Markets. Barber and Odean (2008) show that investors are net buyers of salient companies; investors prefer companies that performed unusually well or poorly on the previous day. Hirshleifer, Lim and Teoh(2009) show that incorporation of financial news slows when more news is available, while Della Vigna and Pollet(2007) show that investors do not take into account the impact of long-term demographic changes when making their decisions.

Menu Effects in Investment Choices are many examples of menu effects - systematic behaviours when individuals are presented with a list of choices - arise when choosing investments such as those offered by a typical retirement savings plan or a regular mutual fund company. One of the most well-known examples is the "1/n heuristic" described by Benartzi and Thaler (2001), which results in the naive diversification of portfolios. If investors are offered n choices, then they tend to allocate 1/n of their investment to each of the choices offered, independent of the risk characteristics of each option. Even when more sophisticated investors choose a subset of the menu of investment options, they tend to apply a conditional version of the rule and split their allocation evenly across that subset (Huberman and Jiang, 2006)

Investment Choice in Pension Plans. In DC plans, the breadth and flexibility of plan offerings is important to ensure that participants are able to meet their individual needs. However, while giving individuals more choices in theory improves their welfare, in practice the complexity of these choices can have adverse effects both on participation and investment allocations. Iyengar, Huberman and Jiang (2008) and Choi et al (2006) show that participation tends to drop as the number of plan options increases. Iyengar and Kamenica (2008) also show that increasing the number of options in a plan affects behaviour by causing investors to reallocate towards low-risk, simpler options.

Emotions and Affect

As Shiv et al (2003) point out the neural systems that drive human emotions have evolved for survival purposes, playing an adaptive role by speeding up decision-making in response to particular automatic triggers. These naturally-occurring responses may be helpful in short-term situations where quick responses are necessary or disruptive when longer-term perspectives should prevail. Emotion can thus have both positive and negative effects on decision-making, depending on the context.

In the domain of financial decisions, specifically, seminal work by Loewenstein and co-authors shows that the emotional state matters: individuals in a "hot" emotional state tend to respond more viscerally. The nature of emotional disposition also matters: not only do people in good moods make overly optimistic judgments (and conversely. Individuals often find it hard to forecast their behaviour in different emotional states (see e.g. Loewenstein 1996; Rick 1998; Loewenstein and Lerner 2003; Loewenstein and Rick, 2010)) and may also suffer from projection bias, systematically expecting their future preferences to be too close to their present ones (Loewenstein et al, 2003). Finally, emotional/affective reaction matters. Ackert et al (2003) suggests that affective assessments should be thought of as cognitive representations of specific positive or negative states linked to a particular stimulus by previous experience, and therefore, naturally, individuals are attracted to stimuli that give rise to positive affective reactions. In both these cases, framing and marketing techniques can also play a role in provoking emotional responses.

Preference for the familiar (home bias) in investments. Across countries, investors tend to allocate a large percent of their assets to domestic equities (French and Poterba 1991), although this may leave them under diversified. While this may reflect high costs of acquiring information, another interpretation is that this phenomenon may be rooted in preference for the familiar.

Advertising content for financial products. Bertrand et al. (2009) analyze the impact of marketing techniques in a mail-order campaign targeting prospective loan customers of a large bank in South Africa. They find that the effect of advertising is large, even relative to price effects. Advertising content is more effective when it triggers an "intuitive" response (e.g. the use of appealing photographs of female models, which changes the behaviour of men, but tellingly, not women) rather than a "deliberative" response (e.g. concrete suggestions for the use of loan proceeds).

4. Applying behavioural economics to financial education

Many of these biases are highly robust across not only the realm of personal finance, but all aspects of individual decision-making. This underscores the difficulty of changing consumer behaviour, even when financial education interventions are able to improve levels of knowledge and motivation. However, the findings of this body of research to financial education can yield insights about how to translate programmes into practice (some of which in fact reflect closely the common-sense of policy makers and practitioners used to working with ground realities rather than the assumptions of economic theory).

Take-up and completion

Voluntary participation in financial education programmes is often hard to achieve. Even after participants are enrolled, many programmes see significant rates of attrition before completion. A further concern is that individuals who are most in need of these programmes may also be most likely to avoid taking up and completing programmes. For instance, those who are likely to procrastinate with respect to the rest of their financial lives may also procrastinate when it comes to obtaining financial education. Meier and Sprenger (2008) demonstrate that in fact, present-biased individuals have more pathological financial behaviour, but are also least likely to sign up for financial education programmes. Naive time-inconsistent consumers may also likewise sign up for financial education programmes, but fail to attend regularly. Individuals with limited attention may also not perceive the need for financial education as salient or immediate, particularly when competing with other pressures in their daily life. Overconfident or over-optimistic consumers may believe that they are less in need of financial education than is actually the case. On the other hand, consumers who are less financially-literate and anticipate the unpleasantness of information overload may deliberately avoid financial education. Finally, individuals who are excluded from the financial mainstream for social or cultural reasons may also selectively opt-out from participation.

Behavioural economics suggests that programmes should design their enrolment mechanisms to take into account present-bias and time-inconsistency, and to reinforce individuals' own commitment to long-term goals of financial well-being. Research on building participation in retirement savings plans has much to offer in this regard. When consumers are present-biased, reducing the monetary and transactions costs of enrolment and participation is extremely important. Paperwork should be minimised, and materials and classes should be offered in formats and locations that are easy to access. In some settings (such as in the workplace), it may be possible to exploit inertia by using defaults: participants could elect to opt-out rather than opt-in to financial education programmes. Present-biased individuals may also disproportionately respond to relatively small, highly-salient cash-incentives or service discounts conditional on enrolment and/or successful completion. To aid hyperbolic individuals, commitment devices could be employed: enrolment could be offered in advance, with a penalty for eventual noncompliance (such as a financial deposit to be returned at the end of the programme).

Marketing and presentation matter. Financial education programmes should increase their saliency and relevance to their target consumers, taking into account variation in preferences, limited

attention and emotional responses. Programme "look-and-feel", the vividness of promotional materials and the general framing of the intervention itself are integral parts of the overall marketing strategy, all of which should be designed with the likely target audience in mind. Decisions about marketing and framing for a specific group should not be underestimated, as consumer responses to the same material may vary significantly. For instance, younger individuals may be more present-biased, and hence material targeted at the young may need to emphasise the immediate benefits of financial education. Alternatively, loss-averse consumers may respond more strongly to loss-framed material that highlights the negative consequences of financial mistakes. On the other hand, if such consequences are too starkly portrayed, consumers with strong negative emotional responses may avoid participation.

Timing is also key: programmes should exploit opportunities to offer education when the context is especially salient (Rabin, 1998): "teachable moments" just prior to making key financial decisions, recurrent events such as tax deadlines (April 15 in the United States), or periods such as the current financial crisis.

Programmes should take into account the fact that consumers may not have rational perceptions of their own need for financial education, or how much they stand to benefit. With overly-confident consumers, some form of initial debiasing may increase take-up, for example, by offering a short quiz, followed by the offer of financial education. Consumers with low confidence may respond better to marketing that emphasises self-efficacy and a "can-do" message, as well as the reassurance that financial education is within their reach. In general, programmes that are able to advertise tangible, quantifiable benefits to participants may find more willing participants.

Finally, appealing to social preferences and peer effects may increase the appeal and take-up of programmes. If substantially high, programmes could make known the number of individuals taking part as a fraction of the target consumer's demographic group, in an effort to build or reinforce social norms. Programmes can also leverage social networking to increase visibility among a particular target audience, by more traditional means such as offering incentives to "refer a friend" or where possible, using newer options such as setting up groups on networking sites such as Facebook.

Content, delivery and knowledge retention

Successfully managing to induce participation is only the first step. Participants in financial education programmes may not internalise the information provided for many reasons. Some may be enrolled for other motives other than education and lack any intention to actually learn the material. In other cases, mandatory participation may be the norm, for instance in schools or as a pre-condition for receiving other financial benefits. However, when individuals are enrolled in a programme by fiat, they may perceive education as intrusive and discount the information received (Hung and Yoong, 2010). Even when participation is voluntary, if programme material is inappropriate, consumers may not engage with the subject, or could even respond counterproductively. For instance, low-income immigrants may have very different financial access, economic relationships and social preferences from the general population. Linguistic and cultural barriers may prevail: they may find financial discussions about irrelevant topics of no use at best or, worse still, alienating. In another instance, individuals who are more sophisticated may perceive overly simple material as boring and are likely to become inattentive and overconfident. On the other hand, those who fail to grasp overly advanced material may find their confidence further eroded.

Financial education that fails to actually educate is thus costly for both the provider and the consumer, and may be worse than no financial education at all. While developing the fundamentals of

an appropriate financial education programme is best left to experts in theory and practice of education, behavioural economics may still add new perspectives to the debate.

When participants have limited attention, programmes are most likely to be successful if they have a narrow scope, or focus on conveying a limited number of key facts or concepts. If overall programme goals are very ambitious, education may need to be delivered via a series of small or even repetitive interventions rather than a sweeping one-time interaction to increase retention and avoid information overload. Alternatively, programmes may take a strategic approach, teaching participants only basic facts and concepts while also educating them about how to seek out further information, rather than attempt to present too much material all at once. Resources (print, online or other) should be provided after the programme is formally concluded, so participants can easily refer to them for specific details if forgotten. Such materials should summarise key information in a format that is easily accessible and prompts recall, such as easy checklists.

This also suggests that individual programmes need to set clear priorities by determining their intended audience and recognising their needs and preferences in order to be selective. As with marketing material, course material should be as salient and relevant to the target audience as possible. Targeting a specific audience applies to content, but also to form. Material should be provided in the appropriate language and at the appropriate grade level. Facts and concepts could be linked to concrete examples based on the experiences of the target audience. The material should be made vivid in creative ways (see for instance, the use of video testimonials from relatable individuals by Lusardi et al. (2009) or by the New Zealand Retirement Commission at www.sorted.org.nz). The overall "look and feel" of the programme should convey an appealing underlying theme and employ frames and non-rational cues that reinforce learning appropriate to the target audience. For example, a significant body of research suggests that gender has an important differentiating role to play in financial decision making: women have different preferences, show different investment behaviour and respond differently to framing of choices (e.g. see Croson and Gneezy (2009), or Barber and Odean(1998)) Age can also be an important example: older populations have very different financial needs and concerns, but also experience changes in cognitive ability and an increased role of affect in decision making (Agarwal et al, 2007)). As such, programme managers should not only address content related to later stages of life, but also be sensitive to the role that emotional framing may play in the presentation of material, for instance by providing education about annuities using positive emotional triggers.

It should also be noted that while targeting is crucial, it should also be handled with care and delicacy, and avoid the use of overtly negative or stigmatising stereotypes. Appealing to individuals in the form in which they feel most control and self-respect can be particularly important. For instance, simply being referred to as the poor may cause lower-income individuals to reject a programme altogether (Ross and Nisbett, 1991).

Furthermore, depending on cost and feasibility, in addition to recruiting and content aimed at the broadly-defined target audience, programmes with sufficient resources may further benefit from gathering more information about individual participants in order to assign more personalised instruction. Braunstein and Welch (2002) suggest using credit score records and other demographic information to develop education materials specific to the needs and difficulties of each individual. Alternatively short, simple diagnostic tools could be used to collect basic data about financial experience, subjective preferences and knowledge, as well as tests for common psychological biases. Individuals could be presented with default course content based on their individual characteristics, with the option to pursue information with different content or at a different level if desired.

More directly, insights from behavioural economics may also be the subject of financial education. Financial education could focus on making consumers self-aware of potential biases and intuitive but misleading heuristics that affect their financial decisions. For example, consumers may benefit from demonstrations of how intuitive responses about growth using simple interest diverge from compound interest calculations. Investors could be educated about how myopic loss aversion can lead to overly hasty withdrawals from risky assets followed by a failure to buy back in and the lock-in of large losses, or how naively implementing the "1/n rule" in their portfolios may lead to naive diversification. To increase relevance as well as saliency, diagnostic tools could also be applied to directly demonstrate individual biases. For instance, individuals could take a simple test that measures discount rates at different points in time to estimate their own personal tendency towards time-inconsistency, followed by the teaching of specific strategies to overcome these problems

At the same time, recognising that individuals have a real need to simplify their financial environment, financial education should aim to help consumers do so in the right way, for instance by teaching proven rules-of-thumb or problem-solving strategies. For instance, to understand compound interest, consumers could be taught the "Rule of 72", which provides a reasonable approximation for the time taken for an investment to double by taking 72/(interest rate).

Special attention should be paid to numeracy and probability, given that even highly-educated individuals have consistent and predictable problems with numerical risk formats and correct probabilistic thinking. In many contexts, it may be appropriate to use verbal or visual representations rather than percentages.

Apart from audience and content, planners need to consider the context for the delivery of financial education and the need to provide education in a supportive environment. Rabin (1998) suggests that financial education may work better in a context where people are cognitively prepared e.g. work or school. Tufano and Schnieder (2008) note that for most Americans, the primary source of funds comes from employment and a number of saving options aim to divert funds at this source. This makes the workplace the most substantively relevant as well as psychologically salient place for financial education. As discussed previously, timing also matters: individuals may also be more receptive to learning during specific teachable moments.

Social preferences and networks can also play an important role in generating a supportive environment. While some interventions may be best delivered anonymously or via mass-media, more intensive education may be best conducted through personal contact with instructors or small-group formats. Small peer groups or individual instruction may be particularly effective in situations where financial matters are considered highly private, where stigma from poor financial literacy or economic hardship is an issue, or where large group dynamics can override the needs of minorities. Discussion among peers and testimonials about success or failure can be invaluable in making problems and solutions more salient and relevant to participants.

In addition, Duflo and Saez (2003) show that word-of-mouth can disseminate education informally across social networks even outside the purview of regular programme activities. Programmes should be aware of these opportunities and if possible, provide additional resources (such as print or online material) for individuals to help ensure that information is correctly transmitted without distortion.

Achieving and sustaining positive behavioural change

Even when participant knowledge is improved, programmes that do not ultimately change behaviour on a significant scale may not be deemed successful. Typically, participants declare their intent to change their behaviour, but only a minimal fraction actually follow through.

One way to increase the likelihood of behavioural change is to link financial education to concrete actions as far as possible. If participants tend towards procrastination, programmes could be connected to immediate decision making. For instance, when studying a financial access initiative, researchers found a large positive effect of having a bank representative who could complete most of the necessary paperwork to open an account present during a financial education event (Bertrand, Mullainathan and Shafir, 2006). Similar interventions could include facilitating enrolment in 401(k) plans or direct deposit to increase savings at the end of financial education sessions. It should be noted, however, that since the concept of bundling education together with an enabling action may be quite powerful, such strategies should be carefully vetted prior to implementation in order to avoid inducing conflicts of interest or other such problems.

In order to avoid feelings of being overwhelmed, desirable outcomes could be broken down into small intermediate steps. To increase saliency, participants could be provided with regular reminders, tools to track and visualise individual progress, such as progressive checklists (with approximate times for completion) or periodic measures of how much they have gained as a result of the programme to date (e.g. additional savings, reductions in debt etc).

Programmes could also suggest or actively train participants to use tools that help them to act on their new knowledge. Very simple decision support could include things as basic as a list of "behavioural warning signs" to look out for before making decisions. Individuals who are self-aware of their likelihood for procrastination could be educated about the availability of commitment devices or taught to create commitment devices for themselves, while those who are more susceptible to overconfidence or emotions could be taught to impose cooling-off periods upon themselves before actually following through on a decision.

More directly, programmes could implement commitment devices to ensure that participants follow up. For instance, after completion, participants could be required to make statements of intended behavioural change and their progress could then be tracked. While clearly requiring additional resources, the cost of such follow-up interventions has fallen significantly with technology, as it is now possible to automate email reminders and calendar notifications, provide online tools for data logging and visualisation, and generate automatic feedback in response to participants. While this may not be possible or cost-effective in countries where Internet or computer access is limited, other channels such as the use of cell phone text messaging could also be explored as alternative ways to extend post-programme support.

Social pressure and peer effects could also be used as commitment devices of this type to sustain behavioural change. Actual group meetings to monitor and encourage progress may be most useful, particularly in settings where community norms are important. Where in-person meetings are less feasible, programmes could also facilitate peer-to-peer discussions through other means such as providing online forums for discussion and support. Alternatively, less direct methods could be applied, such as disseminating information to participants on an ongoing basis about group-level success in changing behaviour, testimonials and success stories.

5. Behaviourally-motivated approaches to other policy instruments

Market failures arise even in the standard economic model, requiring policy makers to play an active role in the provision of public goods and services and in regulation of market participants. However, deviations from the model increase the complexity of designing policies for consumer protection, not only because consumers themselves are likely to act in ways contrary to their own self-interest, but also because such consumers interact with firms that respond to their psychological biases within specific market settings (Barr et al, 2008). Helping individuals overcome biases in order to create a financially-healthy consumer base may sometimes be in firms' best interests (for instance, banks may wish to promote savings and the opening of new accounts). However, as profit-maximising entities, they will fail to do so or to even exploit the same biases when that is no longer the case (for instance, the same banks may seek to encourage over-borrowing by the same consumers). The key observation is that the appropriate nature of any policy intervention may arise not from biases themselves, but from the way that biases ultimately affect market incentives.

In the following discussion we explore several ways in which practitioners and policy makers have drawn on behavioural economics to provide financial goods and services aimed at helping consumers make better choices. Conversely, we also explore some aspects of regulation motivated by behavioural economics where the policy maker's objective is to protect consumers from firms' indifference or deliberate manipulation.

Designing products and environments that encourage better choices

As behavioural economics has gained in popularity, many innovations in programme and product design have been developed to compensate for or even leverage known cognitive biases. Below we examine a number of well-known examples.

Simplifying financial decision making in both private and public spheres. A first principle is to design choice environments that account for limited attention and potential information overload. For instance, Iyengar et al. (2004) suggest that participation in private pension plans may be boosted by offering only a handful of carefully-selected funds, as compared to plans offering a bewildering array of options. Choi, Laibson, and Madrian (2006) propose the use of Quick Enrolment a mechanism which simplifies enrolment in employer-sponsored retirement plans by giving individuals the option to enrol at a pre-selected contribution rate and asset allocation.

More generally speaking, practitioners and policy makers should both be sensitive to the need for simplicity in structure and documentation. As related earlier, this is true of many aspects of tax preparation. In the United States, this has led to the development of a simpler alternative "EZ" federal tax form for qualifying individuals and other initiatives by the IRS (IRS, 2009). In a related example, the United States is also launching a simplified, online federal student-loan application that allows students to fill in income data from information the IRS has on file from tax returns with the click of a mouse, which is projected to increase student loan applications considerably (Camerer et al, 2003). In addition, several private sector and non-profit entities also offer tax preparation advice and software tools that simplify taxes for the individual filer, breaking up the process into smaller step-by-step tasks.

Defaults that encourage positive outcomes. As previously alluded to, defaults can be set to achieve desired outcomes by exploiting status-quo bias, particularly in the case of retirement savings plans. A typical example is switching the default option for employee savings plans from non-enrolment to enrolment at a default contribution rate (while allowing the individual to opt-out if desired). Changing the default to enrolment (with opt-out) dramatically increases participation, with

results across different firms and countries often in the range of 80-90%. Beshears et al (2006) demonstrate that defaults have a strong impact on retirement savings outcomes at all stages of the savings lifecycle, including savings plan participation, savings rates, asset allocation, and post-retirement savings distributions. With respect to investment allocations, in some countries, like the United States, plan fiduciaries are increasingly selecting life-cycle funds as the most appropriate default option. This is also the most common default choice in the Latin American region (including pension systems in Chile, Mexico and Peru) where individuals who do not make an active investment choice are allocated to the provider's different funds according to age (OECD, 2008)

Commitment devices. Other designs address time-inconsistency using voluntary commitment devices. For instance, to encourage savings, commitment savings products have been designed that impose withdrawal restrictions or require savings commitments. In the first case, product rules restrict participant access to funds for a particular period of time or until a specific goal is met. Tufano and Schneider (2008) note that these withdrawal commitments can take many forms, such as the requirement for bank officer signoff for saving withdrawals, term deposits in banks with early withdrawal penalties, tax advantaged programmes that have withdrawal penalties, or private equity investments with limited opportunities for exit. Ashraf et al (2003) show that there can be significant demand for such products from consumers who have self-control problems but are aware of their own biases. It should be noted that desire for commitment devices is not incompatible with a desire for contingent liquidity or emergency withdrawals and that some exemptions of this type may also be added to increase their appeal (for instance, the ability to borrow against 401(k) plan balances in times of hardship).

An example of savings commitments, on the other hand, is Save More Tomorrow, a product developed by Thaler and Benartzi (2004). Participants are offered the option to participate in their retirement savings plan at a low initial contribution rate that automatically increases their plan contributions up to the maximum in later pay periods. Participants essentially commit to allocate a substantial part of their future pay raises to savings, a design that helps overcome loss-aversion by pushing perceived sacrifices into the future while taking advantage of inertia to ensure that the savings are realised. In their evaluation, Thaler and Benartzi (2004) found that Save More Tomorrow not only successfully increased average savings for participants but was also extremely popular, with high voluntary participation and retention rates.

Such product features can similarly be used to address the problem of debt reduction: individuals with large outstanding debts may benefit from voluntary commitment devices that force them to pay down balances or cap their ability to borrow below their actual credit limit.

Lottery incentives. Lotteries can be used to incentivise positive behaviour - a natural application is to make savings more attractive by adding lotteries that give savers the chance to win prizes allocated randomly (potentially at the cost of interest reductions relative to market rates). Haisley et al.(2008b) show that low income populations disproportionately play state lotteries, making such interventions potentially promising in addressing issues related to financial inclusion. While regulations against gambling have prevented widespread adoption of this design (particularly in the United States), Tufano and Schneider (2008) point out that lotteries have in fact been used to promote savings and investment for centuries. A contemporary example is the United Kingdom's Premium Bonds, which award random prizes as part of the savings product's return with drawings held monthly and roughly 1.2 million prizes distributed at each drawing. Private financial institutions have also marketed prize-linked savings products with success internationally, including in Kenya, Mexico, Venezuela, Columbia, Japan and South Africa.

Using mental accounting to build savings. As noted previously, individuals tend to regard tax-refund dollars as particularly "saveable". Prior to 2007, the IRS required that all refund dollars be sent in a single check or deposit, without allowing filers to earmark a portion for saving. To help individuals act on their predisposition to save refund money, several non-profit and private-sector entities such as professional tax-preparers launched initiatives to leverage the opportunity provided by tax deadlines. These including using the prospect of future refunds to motivate unbanked filers to open savings accounts, as well as reinforcing mental accounting with voluntary commitment devices by giving individuals the option to divert funds to savings months or weeks before refund receipt. Starting in January 2007, the IRS began to allow multiple destinations for refunds with its introduction of Form 8888, a policy change that has significantly lowered the costs of facilitating such programmes (Tufano and Schneider, 2008).

Leveraging social networks. One example of using social networks to reinforce positive behaviour is the America Saves! Campaign in the United States, which uses a traditional model of using peer groups to encourage savings. Begun in 2001, the programme aims to encourage people to save by setting up city-wide savings campaigns around providing education and encouragement. Enrolees make a savings plan and pledge to meet their savings goals, supported by various resources including print media, one-on-one meetings, and savers club. In Cleveland, the first adopter, about one-third of participants were poor and non-white, and those who participated in savings clubs were far more likely to report making progress on their savings goals. (Cude and Cai, 2006, as cited in Tufano and Schneider 2008). With increasing Internet penetration, programmes have evolved to embrace online communities via websites, blogs and social networking platforms. Other examples include wesabe.com, a website that combines online money-management tools with a live community of users who contribute ideas and advice to one another, and networthiq.com, a website that allows users to post their own net-worth and benchmark their savings progress with that of the entire community.

Policy makers can promote the adoption of these design principles by aligning the interests of firms with consumers using tax and other incentives, and actively disseminating best-practices among private organisations. For instance, Barr et al (2008) propose giving pay-for-performance tax-credits to banks that offer low-income accounts with some of the features mentioned above. Various initiatives (including that of the OECD and others) are currently aimed at creating common benchmarks and best practices in this area. Kahneman and Riepe (1998) and Benartzi (2010), for example, provide simple checklists for financial advisors and financial services providers, which could be emulated and disseminated for the use of interested firms.

Regulation for consumer protection

Using behavioural economics to improve disclosure

The potential for firms to exploit the limited attention of consumers gives policy makers a strong rationale to ensure that consumers receive better disclosures. Gabaix and Laibson (2006) demonstrate that firms tend to shroud attributes of their products to extract more profits. Even in the absence of deliberate shrouding, consumers show a robust insensitivity to the features and fees associated with financial products of all types (Dominitz et al, 2008).

However, evidence on the impact of existing consumer and investment disclosures is very mixed. Evidence from the United States Federal Trade Commission (2004) showed that disclosing compensation for mortgage brokers would harm consumers, as they increased confusion and resulted in borrowers choosing more expensive loans by mistake. Similarly, the United Kingdom's Better Regulation Executive (BRE, 2008) found that consumer credit agreements not only failed to impart

information, but the length and complexity also effectively alienated consumers from all backgrounds. In the context of investment disclosures, Choi, Laibson and Madrian (2010) show that presenting potential investors with a one-page summary sheet which explains charges and showed how to calculate the impact of fees on portfolio value had only modest positive effects on altering portfolio allocations. Beshears et al. (2009) compared individuals' performance using newly-adopted Summary Prospectuses from the United States Securities and Exchange Commission against standard prospectuses and find that while simplified disclosure significantly improved satisfaction and reduced time on task, actual choices were not much affected. As the BRE report points out, disclosure regulations that are not effective may have a negative overall welfare effect, as they are costly to implement and oversee, burdensome for firms and ultimately appear to leave consumer behaviour unchanged.

Behavioural research suggests several avenues for improving disclosure. Firstly, given consumers limited attention, the principle that "more is better" should be carefully reconsidered. Disclosure presentations should emphasise the saliency of key facts. When comparisons are needed, appropriate use of graphics and tables should be made and standardised information formats for all firms in a given industry should be provided to avoid marketing biases.

In particular, policy makers should mandate the highlighting of particular information that is likely to be underweighted by consumers or shrouded by firms e.g. the true probability of insurance losses or fees for mutual fund purchases. For instance, Camerer et al (2003) propose that state lotteries could be required to post prominent information about the odds and payoffs of the gamble, and that given biases in interpreting small probabilities, it may help to use graphical devices, metaphors or relative-odds comparisons (e.g. winning the lottery is about as likely as being struck by lightning in the next week). In another example, some OECD countries mandate that purchasers of life insurance be provided with a short summary information note of the product summarising its most important features in a clear format. A number of countries also stress the provision of pre-contract and renewal information in clear non-technical language and in large print. Spain has also developed specific regulations regarding the sale of contracts over the internet to heighten awareness of the possibilities for cancellation of the policy (OECD, 2008).

Framing may also be creatively used. For instance, from 2010, credit card disclosures in the United States will present consumers with the minimum payment needed each month to pay off their balances within three years, and how long it would take to be debt-free if only minimum payments are made. In another example, some retirement savings plan statements from financial service providers in the United States show participants their balances as well as projected future income streams. However, this example is illustrative of an additional complexity: in such cases, it is important and often difficult to ensure that consumers also understand the impact of assumptions that are necessarily made in order to generate these projections. To address heterogeneity in consumer needs and prevent information overload while preserving content, another approach is tiered disclosure, which combines simplification of standard forms with directions on how to obtain more information for more sophisticated consumers.

Finally, mechanisms could be put in place to increase the likelihood that consumers have read and understood disclosures, in addition to the common practice of requiring consumers to affirm that they have done so. For instance, consumers could be required to physically enter the interest rate they will be paying on their credit card applications in addition to their signatures.

Product/programme restrictions based on behavioural economics

A more paternalistic direction is to go beyond incentivising desirable programmes and product features by making them mandatory, or on the other hand, limiting perverse product features or deliberate manipulation of consumer biases by law.

Compulsory auto-enrolment. The United States' currently-proposed Automatic IRA is intended to address the problem of individuals without retirement savings plans by imposing a mandatory auto-enrolment programme on employers. In brief, the proposal requires all but the smallest firms to automatically enrol their employees into tax-advantaged individual retirement accounts (IRAs) if they do not offer their own retirement plans, with a minimum of 3% of pre-tax earnings to be direct-deposited into these accounts. While the IRAs would be held at private-sector financial service providers, the default allocation would be held in a statutorily-determined low-cost investment option, and other investment alternatives would also be statutorily-prescribed. Under this plan, employees retain the option to opt-out, increase their allocations or change their investments.

Restricting the use of perverse defaults. In this respect, the European Commission has already drawn on behavioural economics by incorporating new language into the recent proposal for a Consumer Rights Directive that mandates the use of appropriate defaults. This proposal includes a specific provision stating that "the trader shall seek the express consent of the consumer to any payment in addition to the remuneration foreseen for the trader's main contractual obligation". This provision directly addresses the concern that consumers are more likely to overlook and accept a fee if they are asked to opt-out rather than to opt-in.

Another example relates to offers that allow individuals to sign up for a particular good or service for free during a "trial" period, subject to active cancellation. Such "trials" often cause procrastination-prone individuals to become locked into long-term contracts. Regulators could mandate that these deals are automatically terminated at the end of the trial period, instead of defaulting to a long-term contract.

Requiring debiasing feedback for consumers. Paying for commitment devices may be attractive and helpful to sophisticated individuals with self-control problems. However, Malmendier and Della Vigna (2004,2006) show that when consumers are also overconfident about their ability to comply with their commitments, contracts with such devices can become exploitative, inducing upfront overpayment that is ex-post suboptimal. Overconfidence cannot usually be observed by the regulator, but forcing firms to allow individuals who do not ultimately comply to renege on their contracts defeats the purpose of the commitment device. However, regulators may be able to require firms to regularly report feedback to consumers on their performance over time to help debias consumers.

Requiring cooling-off periods. Camerer et al (2003) suggest mandated "cooling-off" periods for consumers when they undertake significant purchases or decisions, to make sure that people do not make bad decisions when in highly emotional states or when they are experiencing untoward social pressure. For example, in the United States, homebuyers are entitled a cooling-off period for home equity loans during which they have a limited right to rescind certain credit transactions.

Complementarities with financial education

Financial illiteracy and perverse behavioural biases are two related but distinct aspects of the same overall problem: poor household financial decision making. Many highly financially sophisticated consumers still suffer from biases such as overconfidence, are overly susceptible to social pressure and tend to procrastinate beyond what they know to be in their own best interests.

Other individuals may not have the cognitive capacity to respond to financial education. It should also be noted that financial education is inherently a long-term endeavour that is not always suited to the delivery of short-term results. In such situations, the effect of financial education on behavioural change is naturally limited, and the consumer needs to rely on the use of appropriate products or the protection afforded by regulation.

However, the reverse is also true: other consumers may lack the information or skills to make decisions about unfamiliar products and services although they are perfectly rational in their preferences, beliefs and decision-making. In a most striking example, Guiso and Jappelli(2005) show that a large fraction of Italian households may not participate in the stock market for the simple reason that they are entirely unaware of the existence of stocks, mutual funds and investment accounts.

Furthermore, product design and regulation are themselves also inherently limited, especially when the determination of the "right choice" is not infallible. Many product features that manipulate individual psychology can be helpful or harmful depending on context. However, the context may not always be clear to regulators and may not always apply to all individuals equally. Implementing such policies with a heavy hand may not be ideal or feasible, particularly if the risk of causing more harm than good is high. Financial education can then act as a substitute or, if such policies are deemed necessary, as a complement to ensure that consumers who are placed at risk are able to protect themselves.

For instance, choosing optimal defaults is not always simple (Ayres, 1989). If the default is set inappropriately, individuals may follow the "wrong" default and simply moving from one suboptimal state to another. In the context of retirement savings plans, Choi et al (2004) find employees in one company improved participation under a default of auto-enrolment but also tended to maintain the default contribution rate as well. Since this rate was relatively low, this actually reduced modal contributions. Setting a uniform default is also problematic when the "right" option may vary by individual types, implying that certain individuals could be harmed even when some others gain. Customising defaults individually (such as setting age-specific default portfolios) may help, but may not always be feasible or possible, given that some determinants of the optimal default may not be observable. Less financially-literate workers are most vulnerable in a situation where the "right" default is ambiguous, as they tend to interpret defaults as advice (Madrian and Shea, 2001). An alternative to setting a default is to require active decisions about participation, but this design still fails to aid individuals who are not financially literate enough to make the appropriate choice (Carroll et al, 2008). In this case, financial education is a critical part of ensuring the safe use of defaults, as financially-literate workers are more likely to appropriately exercise their right to opt-out if the default is not suitable.

Another example illustrates that highly paternalistic regulation may be more expensive to sustain, and ironically may also require more (rather than less) financial education. As individuals tend to underinsure themselves against mortality and morbidity risk, we may consider compulsory insurance. However, as pointed out in OECD (2008), in practice insurance policies in Canada, Italy and France require more information, regulation and supervision when participation is compulsory, in order to educate individuals about their obligation and to ensure that they choose coverage that is appropriate.

As a final consideration, bundling financial education with other products or programmes designed to change behaviour can increase the effectiveness of both. For instance, while making disclosure simpler and more standardised is critical, the use of improved forms could also be made more efficient by financial education that builds consumer familiarity with the specific form types. Conversely, conducting a financial education programme immediately prior to offering any type of product may increase the likelihood of product take-up. Finally, as previously noted, coupling

financial education with a follow-up programme with some form of commitment device may make both interventions more likely to succeed.

Financial education and products and regulations that address behavioural biases may therefore be seen as a set of complementary tools, each of which has its natural strengths. These tools can be used as substitutes when necessary to overcome specific limitations, or in combination to enhance one another.

6. Conclusions

The evidence we have to date on financial education shows both successes and failures. While the importance and scope of financial education programmes have increased and continue to do so, many challenges remain with respect to take-up, retention and ultimately behaviour change.

Meanwhile, behavioural economics has captured the attention of policy makers as a potential tool for consumer protection. In 2007, the Australian Government Productivity Commission organised a Roundtable on Behavioural Economics and Public Policy (AGPC, 2008). A similar meeting to discuss behavioural economics was also held in the United States by the Federal Trade Commission in 2007. In 2008, the European Commission Director General for Health and Consumers convened a conference entitled “How Can Behavioural Economics Improve Policies Affecting Consumers?”

Simple strategies that draw on behavioural economics to improve financial education programmes include:

- Adapting administrative processes to counter present-bias and time-inconsistency, and reinforce commitment to long-term goals of financial well-being.
- Creating marketing materials and content for financial education programmes that are salient and relevant to the target consumer, taking into account variation in preferences, limited attention and emotional responses.
- Ensuring that the level of material is appropriate for the literacy and numeracy of the target audience, and that content is simple without being simplistic.
- Providing education at a time and in a context that supports cognitive preparation, such as in school and in the workplace.
- Developing and using appropriate diagnostic tools to help consumers recognise their own needs and biases, and teaching individuals strategies to help overcome the latter.
- Clearly communicating specific, concrete and actionable steps and linking the educational process to immediate action if possible.
- Reinforcing education with external decision support in the form of information resources and tools that are easy to find and use, potentially including commitment devices to motivate and sustain behavioural change.
- Recognising and working with social preferences to increase take-up, retention and follow-up, including in-person education, group interaction or social networking.

While behavioural economics gives us new insights into ways to maximise the impact of financial education, it simultaneously highlights other psychological and cognitive factors that can also ultimately act as binding constraints to change and therefore reminds us to be realistic about financial education itself. Used appropriately, behaviourally-motivated products and regulations can help compensate for the limitations of financial education. The reverse is also true: financial education supports and enhances the use of behaviourally-motivated products and regulations. These instruments can and should be regarded as complements when addressing the full spectrum of issues related to household financial decision making. Increasing the effectiveness of financial education thus remains a priority for policy makers and practitioners, and integrating future developments in behavioural economics into financial education is a key part of continuing to do so.

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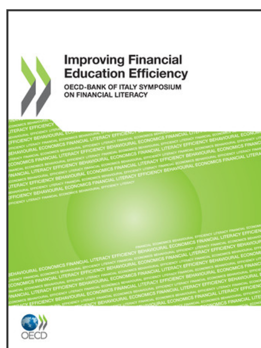

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