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Financial Literacy Education and Behaviour Unhinged: Combating Bias and Poor Product Design

(Financial literacy education and behaviour unhinged)

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ABSTRACT

The growth of products available in the consumer financial market has provided more choice and formal control over household financial decisions than ever before. Financial literacy education programs are generally assumed to improve consumer behaviour in relation to financial products and services. However there is scant evidence that demonstrates the causal link between education, literacy and behaviour. Through the use of a sample study we show that the actions of individuals who are financially literate does not necessarily mean they will demonstrate good financial behaviour. We propose that in order to improve the financial behaviour of consumers two critical areas need to be addressed. Firstly the objectives of financial literacy programs should be to not only educate consumers about financial markets and products but highlight to individuals the psychological biases and limitations that they as humans, cannot easily avoid. Secondly the regulation of financial products sold to consumers needs alteration to meet the aim of protecting retail consumers from complex financial products that are confusing, ambiguous and inappropriate. We propose regulation and redesign of product information offerings using techniques employed in ecological interface design models to derive a suitability test for consumer financial products.

Key words: Financial literacy education, consumer behaviour, retirement, investments, ecological interface design.

INTRODUCTION

The growth in the consumer financial market provides extensive choice and formal control over a wide variety of personal financial products. Households increasingly make financial decisions in every aspect of personal finance including retirement fund portfolio choices, personal credit, home mortgages and insurance. Retirement funds, once dominated by defined-benefit pensions, are now largely made up of defined-contribution plans requiring individuals to make tax-advantageous savings contributions optimised over their investment horizon and preferred level of risk aversion. Similarly, employer-sponsored health and life insurance has been replaced with individual policy choice for individuals and families. In the credit and mortgage markets, individuals are confronted with a great variety of products ranging from quite simple to very complex structures whilst the onus of managing prudential credit levels increasingly rests with the individual.

Consumer choice paired with full product disclosure has become the common approach to regulating personal finance products in many countries. However the range and complexity of financial products has increased without a commensurate growth in the level of financial literacy (Lyons et al. 2006; Willis, 2008). Financial literacy education (FLE) is widely believed to be the panacea that bridges the gap between consumer decision making and increased financial product complexity. Both mass-market and targeted FLE programs are assumed to turn individuals into active financial market participants who are motivated and equipped to manage their own credit, insurance, savings and investment matters. A critical assumption of this approach is that good financial outcomes are associated with participation in FLE programs while bad financial outcomes result from financial illiteracy, regardless of wealth or other personal characteristics (Benartzi and Thaler, 2007). However the characteristics that directly link financial literacy with optimal financial behaviour have not been established in the literature (Willis, 2008). While it is generally agreed that financial education is necessary to improve consumer behaviour in relation

to financial products and services, there is scant evidence that demonstrates a causal link between education, literacy and resulting behaviour. A key question is how can mechanisms be developed to facilitate self control and adherence to financial plans as well as offering consumers sufficient choice coupled with adequate protection?

Two links must hold for conventional financial education to be effective. Firstly education must improve relevant knowledge and understanding (financial literacy) and secondly better knowledge must change behaviour. This paper canvasses the degree of success of a set of FLE programs in the literature which suggests that the lack of a reliable link between the provision of education and financial behaviours motivates a re-examination of the approaches of FLE programs. In concert with renewed emphasis of FLE delivery, we suggest that an alignment of financial product simplification with consumer behaviour through self-regulation may help alleviate the incidence of financial service firms taking advantage of consumer deficiencies in financial literacy. The paper underscores some of the common barriers to behavioural change despite participation in FLE programs identified in the literature and highlights an alternative approach that avoids these heuristic obstacles borrowed from ecological interface design (EID). This approach to product design and education targets interface design that was originally introduced specifically for complex socio-technical, real-time, and dynamic systems, but could be adapted within a structural approach that addresses FLE and financial product simplification. Heuristics, biases and coping mechanisms that influence personal finance behaviours ensure that FLE alone will not override poor financial behaviours of consumers.

It is important to note that some countries in Western Europe, Canada and New Zealand have made significant advances to better link financial product design with consumer behaviour. While this study investigates specific examples of FLE and financial product design, the discussion is intended to be sufficiently general to cater for different countries experiencing different reactions to product design and consumer behaviour.

THE DISLOCATION BETWEEN KNOWLEDGE AND BEHAVIOUR

Good and bad behaviours

This study argues that the explicit link between financial literacy and behaviour has not been established. No financial literacy study has yet clearly linked economic wellbeing with sustained changes in financial behaviour. Furthermore financial literacy does not appear to be a sufficient prerequisite for good consumer financial decision making. Willis (2009) claims that the efficacy of FLE is largely based on ideology rather than evidence and a critical examination of the studies commonly cited as proof of the effectiveness of FLE reveals a number of shortcomings. The link between FLE programs and understanding basic financial concepts has been shown to be at least somewhat effective over the short term (Mandell, 2004; Peng et.al, 2007). However the subsequent causal link between financial literacy through an understanding of financial concepts and financial behaviour has not been reliably established (Bernheim et al. 2001; Gross et al. 2005; Benartzi and Thaler, 2007). It is important to note that much of this study has been confined to the markets of Canada, US and Australia. Defining the pedagogy of the general approach to FLE programs in the developed economies of Western Europe, US, Canada, Japan, Australia and New Zealand is difficult to consolidate into a single model. Financial literacy resembles a relatively disparate collective knowledge of numeracy, logic, financial terminology and economic awareness developed though formal education and informal learning that confounds precise definition. Our definition of FLE here will therefore be broadly based on all cognitive dimensions

of knowledge rather than the narrow focus typically approached through the defining of FLE programs.

This study focuses on the second causal link between FLE program outcomes and financial behaviours. The model of effective FLE endorsed by most advocates including financial regulators (Willis, 2008) is the conversion of financial education into financial literacy which then relies on the transformation from financial literacy to good financial decision making and rational behaviours.

The great challenge for financial literacy education providers is to show that education does make a difference to how people behave. In general, what people say they will do is known to diverge from what they actually do (de Meza et al. 2008). Gross et al. (2005) developed a financial advocacy course for law students and while the data reveal that the course was successful at improving the financial literacy of students, the study found only minor changes in actual behaviour. Other surveys relating to the effectiveness of FLE rely heavily on self-evaluation where individuals assess their own knowledge, report their own behaviours, evaluate their financial situation and recall their FLE exposure (Lyons, et al. 2006). Consumer self-assessments are a measure of confidence, and potentially overconfidence, rather than a robust measure of financial literacy (Willis, 2008). Lyons et al. (2006) reported that those who think they changed their behaviour are more eager to report it and those who do not are less likely to disclose such information. A study comparing bankruptcy debtors who received financial training with those who did not found that, once controlling for other differences between the groups, the training was in fact associated with a small negative effect on outcomes (Courchane et al. 2008; Mandell and Klein, 2009). From this brief review it is apparent that the causal link from FLE to literacy and then to behaviour has not been established.

Literacy and behaviour - A case study

To examine the causal link between financial literacy and behaviour we focus on a case study that examines the behaviour of highly literate investors against much less literate investors, as well as the motivations underlying each investor type. In 2008 the Australian Securities and Investments Commission (ASIC) commissioned a study to analyse the financial behaviour of individuals investing in unlisted, unrated debentures (UUD). A debenture is a legal undertaking given by a company to repay money lent to it; essentially a medium-term debt instrument that is not secured by physical assets or by collateral. Debentures are backed only by the general creditworthiness and reputation of the issuer. Unlisted, unrated debentures do not have an explicit credit rating since they have not been independently credit reviewed. Furthermore they are unlisted which generally means they cannot be traded in a liquid secondary market.

The research included a qualitative stage (3 focus groups and 12 in-depth interviews) followed by a quantitative stage (1,142 online and phone questionnaires). The quantitative sample covered 355 separate investments of 280 individuals across 27 different debenture issuers. The majority of investors were located in Australia with some sophisticated investors domiciled in Europe, Asia and North America, while all debenture issuers were Australian companies. Across all investor groups the quantitative sample is sufficiently robust to ensure a 95 percent confidence level for the analysis. The investors were considered to be relatively well informed individuals with general access to financial literacy assistance, via for instance financial advisors or government agencies, when required.

The majority of UUD subscribers were individuals who invested in two investment vehicles that became insolvent and went into administration in May 2007. The study examined the behaviour

of two different types of investors which divided the numbers surveyed roughly in half. The average Type A investor was older and educated at or below high school level, and sought investments with perceived security as well as solid returns and capital protection, in order to provide income in retirement. The second set of investors Type B, were middle-aged with post-graduate qualifications also attracted by the perceived security and return in the debentures and sought capital growth for the long term. The study also includes a control sample of general investors who also invested in UUDs, which included a much broader and heterogeneous cross section of investors, including Type A and B investors. The lower level of susceptibility to advertising, the greater use of qualified formal advice networks and the higher education level of Type B investors categorises them as generally more financially literate than Type A investors as per Worthington (2006) and Lusardi and Mitchell (2007). However the sub-optimal behaviours of both investor types are at times indistinguishable.

A clear finding from the qualitative research was that Type A investors tended not to seek the advice of others when making their investment decision (ASIC 2008). In part this was because, unlike Type B investors, these investors generally did not to have networks of friends, family or others who regularly invest or discuss investing. Other reasons included belief that the decision was simple and relatively risk-free, a perception that the sales representative adequately satisfied all their questions and they possessed a deep-seated mistrust of paid advice. Reflecting these findings, Type A investors were much less likely to cite advisers or associates as influential on their investment decision and far more likely to cite advertising as a key influence. Paradoxically, while Type A investors tended to reject paid investment advice on the basis that it was sales-orientated and expensive, they were consistently able to trust in the salespeople that they met. Table 1 illustrates the most influential factors in the investment decision for both investor types. Advertising had a much greater impact on Type A investors relative to Type B while financial advisers and social networks dominated Type B decisions.

	Type A (%)	Type B (%)	General Investors (%)
Advertising	88.1	20.3	19.0
Financial adviser	3.9	45.2	26.6
Social network	3.3	20.7	17.3
Other	4.7	13.8	37.0

Table 1: Most influential factor in the investment decision for UUDs by investor type. Source: ASIC (2008) Report 126 Understanding investors in the unlisted, unrated debenture (UUD) market.

In line with prudent financial decision making, investments in risky debt instruments such as UUDs generally form part of an investor's total portfolio. However diversification was a key investment driver for only 12.6 percent of investors and all types of investors maintained relatively low levels of investment diversification. Most investors across the sample invested less than 25 percent of their total investments in their largest investment but Type A investors were more likely to have invested more than 75 percent of their total investments in a UUD compared to Type B investors (ASIC 2008). To control for financial literacy differences, in both the qualitative and quantitative stages of the research, investors were asked to comment on the term 'diversification.' Most investors felt they understood the importance and meaning of diversification but some were unable to describe it clearly or accurately, while others actively chose not to practice it. In the quantitative stage of the research, about a quarter of Type A investors said they did not understand the meaning of the term diversification compared to around 10 percent of Type B investors. Table 2 summarises the main reason for investing in UUDs by investor type. Retirement income and long term saving constitute the majority of investment reasons for both investor types.

	Type A (%)	Type B (%)	General Investors (%)
No particular reason	2.4	8.2	4.5
Holidays/hobbies	4.9	3.9	2.4
Retirement income	48.6	28.0	29.6
Long term saving	17.9	28.5	25.9
Cash investment	5.4	14.7	9.7
Portfolio diversification	8.2	13.6	15.4
Other	12.5	5.7	12.6

Table 2: Main reason for investing in UUDs by investor type. Source: ASIC (2008) Report 126 Understanding investors in the unlisted, unrated debenture (UUD) market.

Many UUD investors in this research, regardless of investor type did not have a complete understanding of the product they had invested in. Some, including Type B investors with very active UUD portfolios, did not even realise they were investing in a debenture. Only 3.6 percent of the active UUD portfolio investors surveyed selected 'debenture' from a list when asked to identify which investments they held. As expected Type A investors associated lower levels of risk with their investment than Type B investors. Curiously investors who said they had received the prospectus (71.6 percent) rated their understanding of the prospectus as medium to high. Table 3 provides the survey results of which investment type investors considered to be highly risky. Type A and Type B investors both believed an emerging markets fund was the riskiest investment overall, followed by a debenture in property development (UUD).

	Type A (%)	Type B (%)
Term deposit	3.4	4.5
Government bond	3.0	2.5
Debenture (in property)	28.1	27.1
Investment property	8.5	4.3
Stock in a blue chip company	6.4	6.4
Emerging market fund	50.6	55.1

Table 3: Ranking investments by perceived level of risk for UUDs by investor type. Source: ASIC (2008) Report 126 Understanding investors in the unlisted, unrated debenture (UUD) market.

Table 4 outlines the risk each investor type associated with the UUD investment. Interestingly the vast majority of both Type A and Type B investors classified the investment as low risk, even though they stated that a debenture in a property investment was second in riskiness only to emerging market funds, see Table 3. This differential highlights the total lack of understanding by both inexperienced investors and financially literate investors, including active UUD portfolio investors, concerning the characteristics of a debenture investment and the associated risk.

	Type A (%)	Type B (%)
No risk at all	24.3	13.6
Very low risk	28.1	23.3
Low risk	20.4	28.2
Medium risk	22.7	27.2
High risk	3.6	5.8
Very high risk	0.9	1.9

Table 4: Level of risk in the UUD at time of investment by investor type. Source: ASIC (2008) Report 126 Understanding investors in the unlisted, unrated debenture (UUD) market.

While the characteristics of the UUD were disclosed in the prospectus it seems that consumers did not read or understand the product description, which challenges the true level of financial literacy assumed of both sophisticated and inexperienced investors.

THE LIMITS OF FINANCIAL LITERACY EDUCATION

Financial literacy education teaches financial concepts undertaken with the explicit purpose of increasing knowledge and skills as well as generating motivation and confidence to use learned skills. But the complexity of even standard financial instruments suggests that basic financial knowledge and skills are not enough to equip retail consumers to manage their finances. Financial behaviours that sound simple are not necessarily so. A message to buy prudently or not spend excessively is not instructive because there is no general agreement on what constitutes prudent or excessive money management practices. Instructing a consumer to never to pay late or exceed their credit limits could be a poor decision under some circumstances (Willis 2009).

Education in the face of cognitive bias

The field of behavioural economics has identified a range of fundamental cognitive biases that influence decisions in both financial and non-financial contexts. The considerable evidence suggests that these factors influence all aspects of decision making, though how prevalent and persistent they are remains contentious. The empirical work is often situated in contexts other than personal finance but such biases do not appear to be domain specific. Psychological rather than informational differences appear to explain much of the variation in financial capability. Three longitudinal surveys of adult financial literacy in Australia (ANZ 2003, 2005 and 2008) reported differences that applied to both individuals and competency cohorts. The surveys all indicated that in most capability categories, literacy levels improve with consumer age, wealth and the level of general education which is consistent with the importance of attitudes rather than imparting specific knowledge (Benartzi and Thaler 2007). If poor financial capability is dominated by individual psychology, the information-based approach of most FLE programs is likely to have only a modest effect in improving outcomes.

Even if financial-education programs tried to reduce or eliminate decision making biases, the evidence on debiasing indicates that such an attempt would have little positive effect. Consider the well-known heuristic of desensitised consumption. Overpriced mortgage insurance is generally more easily accepted once the commitment to major mortgage is made. Having spent a large amount on one item the consumer is desensitised to accessory items. Firms exploit this cognitive behaviour by discounting the main product to entice the customer in and then proceed to earn more than the sacrificed primary profit on secondary sales (de Meza et al. 2008).

Plugging the literacy gap through product regulation

One approach to enhance financial security is what has been referred to as choice architecture - designing environments so that individuals are nudged to act in their own self-interest while still retaining freedom of choice, rather than fall prey to behavioural traits that research has shown work against them. When a consumer seeks advice or buys a product from a financial services firm, the consumer is protected to some degree by the regulatory system. Rules and regulations give consumers rights in certain circumstances however the consumer still takes responsibility for their investment decisions. The principle of *caveat emptor* is modified to varying degrees in different regulatory regimes but rarely excluded altogether. In any case most consumers are only vaguely aware of the existence of such protection.

It has been argued that product complexity is not a reason to have extensive consumer protection through regulation, or to give investors any particular protection which is distinct from that offered to consumers of other types of goods or services (Stigler 1961; Schwatz and Wilde 1979). Goods and services are, in economic terms, generally referred to as *experience goods*. Consumers learn about the quality of the good from their experiences of using it. In contrast financial products sold to retail investors are *credence goods* and consumers do not necessarily have the skill and expertise to assess their quality (Wolinsky 1995). While there is some evidence that increased experience in buying a range of financial products does improve an individual's financial capability (Campbell, 2006), most financial product purchases occur infrequently providing little opportunity for experience to inform the purchasing decision. Investment products are incomplete contracts which mean their value is determined after the contract has been agreed and is dependent on the activities and skills of others (Wolinsky 1995). This is so even in circumstances where no fiduciary relationship arises, and is enhanced in circumstances where it does.

Financial education in the form of information transfer may be necessary but it is not sufficient. To enhance the financial security of vulnerable consumers it is clear that some form of product and even behavioural intervention is required. Financial strategies such as savings defaults, direct deposit and debt management plans represent mechanisms where individual behaviours are strongly guided. Coupled with consumer product regulation these have proven to be a highly effective way to change real financial behaviour (Choi et al. 2006). A complement to behavioural intervention education and regulation is financial advice. This might take the form of a paid advisor, pro-bono counsellor or financial coach provided through community organisations, but the magnitude of financial illiteracy in most countries suggests that these approaches are prohibitively expensive.

Choice architecture

Some researchers have suggested that the best response is not to inform consumers of their psychological biases or attempt to change their behaviour, but to address consumer deficiencies via institutional design and regulation that recognises the limits of human psychology (Willis, 2008). Rather than educating individuals out of error, a more effective approach may be to take the biases into account when designing financial product disclosures and options available to retail consumers. One example is to change defaults, as advocated in the research of Choi et.al (2003) for 401(k) plans where saving rates were shown to be much higher if employees are enrolled in savings schemes from which they can easily opt out of than if there is no automatic deduction with an easy opportunity to opt in. Another example is to set hard deadlines for pension choices featuring sensible default options in the absence of a decision within a certain timeframe.

Adapting the presentation of financial product information to retail consumers requires more than simply full disclosure of product features. Product information should match cognitive understanding so that consumer biases are not exploited. One approach to redesign the consumer and financial product information interface stems from the field of ecological interface design (EID). This is an approach to human interface design that was originally introduced specifically for complex sociotechnical, real-time and dynamic systems (Burns and Hajdukiewicz; 2004). It has been applied in a variety of domains including process control (e.g. nuclear power plants, offshore oil rigs) and medicine and has been especially successful in developing methods to help eliminate human error in aviation operations. The goal of EID is to make constraints and complex relationships perceptually evident to the individual. This allows more of the individual's cognitive resources to be devoted to higher-order thought processes such as problem solving. EID is based on two key concepts from cognitive engineering research: the abstraction hierarchy (AH)

framework and the skills, rules, knowledge (SRK) framework (Rasmussen, 1990; Vicente and Rasmussen, 1992). In the EID framework, the AH framework is used to determine what kinds of information should be displayed on the system interface and how the information should be arranged. The AH describes a system at different levels of abstraction using how and why relationships. The SRK framework employs layers of cognitive control which may offer a more appropriate suite of mechanisms to regulate financial product design.

Rasmussen's SRK model describes three different levels of cognitive control that might potentially be used by an individual during a task (Wickens et.al, 1998). If an individual is extremely experienced with the task, they will process the information at the skill-based level of performance reacting to the raw perceptual elements at an automatic, subconscious level. When individuals are familiar with the task but do not have extensive experience they will process the information and generate actions at a rule-based level. Finally when the situation is novel, individuals will not have access to rules stored from previous experience to call on and they will therefore tend to make decisions at a knowledge-based level (analytical processing using conceptual information).

The low level of financial literacy in most domains indicates that the majority of consumers seeking to invest or purchase financial products will generally engage at the knowledge-based level. To address the perceptions of consumers at this level, given the current disclosure rules and presentation features of most financial products, the human interface needs to be redesigned so that the critical characteristics of each product are emphasised and there is little room for misinterpretation. In the context of sophisticated systems, human error and the negative consequences can be decreased in one of three ways: system design, training and/or personnel selection (Wickens et al, 1998). As described in the literature review above, training and education have had limited success while nearly all consumers will, at some stage, interact with the financial services sector, so personnel selection cannot be avoided. Therefore changing the design of the information presentation system is the critical element that can be addressed through an EID approach.

For system design, errors can be reduced by making it impossible for a person to commit an error, making it difficult to commit an error, or making the system error tolerant so that when errors occur, the negative consequences are avoided. Error tolerance can be achieved by methods such as feedback to the operator about current consequences, feedback about future consequences and monitoring actions for possible errors. Design features must also be included so that erroneous actions can be reversed before they have serious consequences on outcomes. The goal is to reduce, if not eliminate, the risk of inappropriate product consumption through interface design. Figure 1 outlines the basic SRK framework for an asset allocation decision, adapted from Rasmussen and Vicente (1989). The error frequency increases exponentially when an individual is operating at a knowledge-based level, which is the primary environment in which consumers make investment decisions.

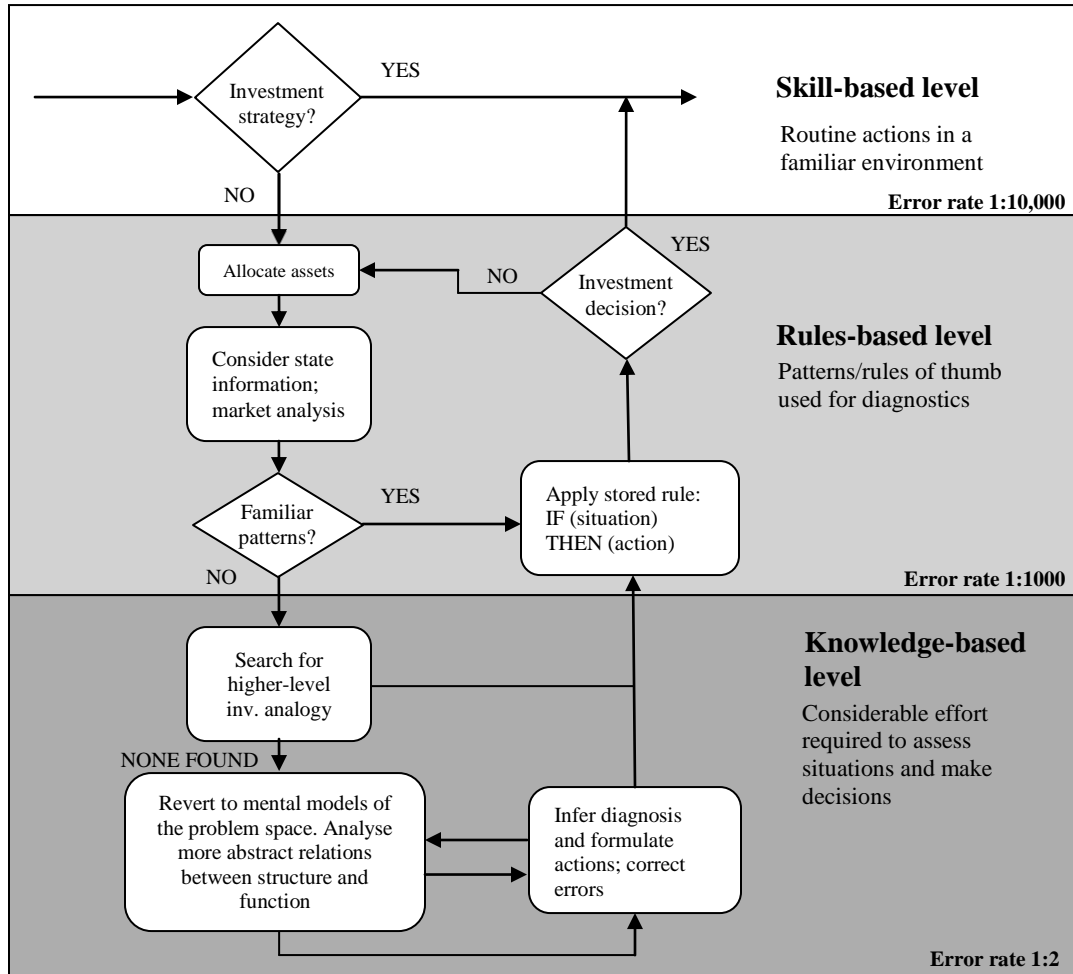


Figure 1: Dynamics of generic error modelling system adapted to investment strategy decision (adapted from Rasmussen and Vicente (1989)).

Financial institutions that rely on product sales would naturally oppose such disclosure rules and claim that the great variety of product offerings related to banking services, investments, insurance, credit and other services over different time horizons would render this approach simplistic. However the inclusion of a *suitability test* for all financial products sold to consumers partially shifts the risk of inappropriate product engagement from the consumer to the firm. Not only disclosure, but the way in which such disclosure is transmitted to the consumer is vital. Knowing that the flipside of intervention is the potential risk of moral hazard, regulatory intervention in the form of suitability tests may avoid the total surrender of consumer responsibilities.

In the UUD example above a number of EID design features would emphasise the critical characteristics of the product to correctly portray the risk level and suitability for consumers. Firstly the consumers who purchased the product would have been better informed had a simple sentence, outlined below, been included on the first page of the offer:

Debentures are not like bank deposits, and carry a higher risk that you will lose your investment. This product is an unlisted, unrated debenture. Unlisted, unrated debentures are the highest-risk category of debentures.¹

Adjusting the interface (prospectus) to adapt the knowledge-based level of understanding of retail consumers and simplifying the information would remove much of the ambiguity of product disclosure. The risk characteristics of the product could be further emphasised by graphically illustrating the risk and return characteristics within a standardised risk-return trade-off diagram. Downside risks should be emphasised including the maximum loss amount possible over the product life. Product suitability tests that accurately describe the type of situation such a product is designed for consumers should also be included in product offering documents. Making these and other disclosure clarifications standard across all financial product offerings to consumers would alleviate the ambiguity implicit in financial product disclosures. For UUD investments a clear diagram showing the risk return trade-off within a matrix relative to other investments would eliminate ambiguity along with clear statements that emphasise the possibility of 100 percent investment losses. A suitability test would filter the product to ensure that UUDs are sold for investors seeking a high-risk/high-return investment for their portfolio. Another option is mandatory cooling-off periods which would permit investors to withdraw from the investment should they regret such a decision after sale pressures are removed. Finally, financial capability scoring similar to credit scoring techniques conducted by lending institutions could be an important filter to limit the range of consumer options however this would represent significant financial reform.

Much of the recent EID literature shows that in situations requiring problem solving, EID improves performance against existing design approaches in many industries. Indeed some research has shown that the magnitude of the advantage of employing a well-designed EID interface increases significantly with task complexity (Xu et al. 1999). This work also demonstrated that EID can be easily applied to information retrieval and that doing so can identify new information requirements to improve performance on more complex tasks.

However an obstacle to the implementation of EID for financial products is that the choice of visual form remains at the whim of financial institutions which resembles art rather than science. A great deal of creativity is needed to transform from an abstraction hierarchy model of the knowledge domain to a particular interface form. Some guidance can be obtained from perceptual organisation principles but there is a diverse array of alternative avenues (Vincente, 2002).

Consumers have been shown to be poor at distilling the important elements of the product characteristics from financial disclosure documents. Redesigning financial product disclosure using the EID concept would obviously require significant expertise in financial regulation however the relative impotence of FLE programs implies that such an approach is necessary for retail consumer protection.

CONCLUSION

In this study we have examined the absence of a clear link between financial literacy education and financial decisions and behaviours. The literature highlights a lack of evidence to establish this causal link and we have examined one particular study in depth to emphasise that financial literacy itself has little effect on actual financial behaviour. This motivates us to examine

¹ Consumer Action Law Centre submission to ASIC Consultation Paper 89: Unlisted, unrated debentures - improving disclosure for retail investors, October 2007.

alternative ways to address the actions and consequences of poor financial behaviour by consumers. We propose that in order to close the FLE and behaviour gap two critical areas need to be examined. Firstly the aims and objectives of FLE programs should be to not only educate consumers about financial markets and products but to highlight to individuals the personal biases and limitations that they, as humans, cannot easily avoid. The second area looks to greater regulation of financial products aimed at retail consumers as well as product disclosure redesign aligned with a knowledge-based decision level in the context of interface design. These approaches have the potential to substantially protect retail consumers from purchasing confusing, ambiguous and inappropriate financial products. Further work is needed to extend our work to cater for broader aspects of human behaviour and learning, and to include nuances from the social and cultural dimensions of human behaviour in consumer research.

APPENDIX

Demographics		Type A	Type B
Age (years)	Average (mean) age	64	41
	Min age	46	26
	Max age	82	54
Gender	Female	39.6%	35.4%
	Male	60.4%	64.6%
Marital status	Never married	5.1%	14.0%
	Married	65.1%	67.6%
	De facto	4.9%	12.0%
	Separated	2.3%	1.7%
	Divorced	11.6%	3.0%
	Widowed	10.4%	0.4%
	Other	0.7%	1.3%
Education	Primary school	1.6%	0.0%
	Some secondary school/Technical college	9.0%	1.7%
	Intermediate Form 4 Year 10	17.0%	2.1%
	Apprenticeship	2.8%	1.1%
	5th form Leaving Year 11	7.8%	2.7%
	Finished technical college	8.3%	4.4%
	Finished secondary school	6.4%	6.1%
	Some university	4.7%	8.7%
	Diploma or degree	26.4%	39.8%
	Post graduate qualifications	16.0%	33.4%
Employment status	Full-time employed	26.9%	80.5%
	Part-time employed	14.8%	11.4%
	Semi-retired	4.1%	1.5%
	Retired	49.1%	2.1%
	Home duties	3.6%	2.8%
	Still studying	0.0%	0.8%
	Looking for work	1.5%	0.9%
Annual household income (per annum)	\$1–\$52k	49.8%	9.2%
	\$52k–\$104k	23.8%	22.4%
	\$104k–\$250k	21.1%	57.1%
	\$250k or more	5.1%	11.2%
Government support	Age and disability support payment	25.4%	2.8%
	Unemployment, education and sickness benefit	0.7%	0.4%
	Other government pensions and benefits	16.0%	3.6%

Table A1: Demographics by investor type. Source: ASIC (2008) Report 126 Understanding investors in the unlisted, unrated debenture (UUD) market.

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