The Provision of Information to Members of Defined Contribution Schemes – A Review of Existing Research

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Background

The focus of this paper is the provision and communication of information to members of defined contribution pension schemes. It brings together relevant outputs from researchers, practitioners and regulators, and highlights findings, suggestions and implications. The review is based on around 100 articles, mostly involving research carried out in the US and UK. The body of evidence mainly comes from the discipline of economics and within this the fields of finance and behavioural economics. Experimental and survey data are the most common type of evidence. The particular focus is the UK, with international evidence drawn on to support. This review was prepared for the 2011 JP Morgan Gleneagles Investment Conference. The review is organised as a series of questions. Throughout, the term 'information provision' refers to the provision and communication of information. The literature on financial advice is not part of the review. The questions addressed in the review are:

Questions

1. Why is there interest in information provision?
2. What high-level information gaps exist?
3. How is information provision expected to influence consumer decision?
4. Will information provision increase pension saving but crowd out other saving or important expenditure?
5. Does information provision benefit most customers with less information need?
6. How do high-level messages help?
7. Can information provision affect consumer risk taking and fund choice?
8. Do visual illustrations influence consumer decision?
9. If information was to encourage someone to begin thinking about planning, would he or she end up with a larger amount of wealth because of it?
10. What variability is currently illustrated in pension projections?
11. Is the workplace a ‘teachable moment’ for stimulating retirement saving?
12. Do working people inquiring about a pre-retirement cash lump sum have a specific information need?
13. What is the potential of a total combined pension forecast?
14. How are DC regulators expected to appraise the information environment?
15. How is the pension section of employer and pension scheme websites used?

Executive summary

- Saving in a pension does not crowd out other saving and important expenditure. This is consistent with a possible role for further information provision.

- The present-day information landscape is crowded and congested. Disparate pieces of further information are unlikely to have even modest impact. For salient information to be heard and acted on, its signal needs to crowd out peripheral information. This is more likely to occur through standardised information for it increases the proportion of total information delivering a consistent message.

- Short, high-level messages can have a positive impact because people's investment behaviour may in part depend on attributes which are amenable to financial rules of thumb. The delivery of high-level messages also appears promising given job turnover statistics that indicate people will be enrolled into a variety of schemes over their working years.

- The key to a high-level message is the delivery of an easily digestible slogan rather than the reason behind the advice the message gives.

- The coordinated approach needed to execute general, high-level messages suggests this might be owned centrally, perhaps by government or combination of regulators who together have oversight of the entire DC pension scheme landscape.

- Information provision has potentially greater impact when it contributes to decision making, for example varying contributions, taking a pre-retirement cash lump sum, when and how to take retirement income. Information that contributes to decision making also needs to help unscramble confused consumer preferences if it is to produce solutions to problems of revealed preference. Passive information that does not serve an action may crowd out relevant information, overload thinking and increase indecisiveness.

- Addressing specific gaps in information provision might be secured by shutting-down existing uncoordinated information that has the potential to

mislead. Existing information mechanisms not previously tested for consumer effectiveness might be usefully reappraised and more firmly linked to action.

- Information is more likely to be absorbed and acted on if it is kept simple, does not mislead, communicates clearly, addresses separate narrow topics, and in aggregation is complete.

- Even then, some amount of both existing knowledge and education appear to be precursors to further use of information. The most likely scenario is that additional information will benefit most those customers with less need for information.

- Low knowledge individuals are likely to feel overwhelmed regardless of information presentation. The presumption that basic information to low knowledge people can have a major positive benefit does not fit well with existing knowledge from consumer research and financial literacy campaigns. Low knowledge individuals are disproportionately more likely to turn to family and friends for information, while more financially sophisticated individuals rely on websites, newspapers, and other print and electronic media.

- Evidence on illustrations finds that narratives perform especially well for low knowledge individuals, who give greater weight to non-numeric information. Generally, bar charts do not perform well, frequencies perform better than probabilities, a range (minimum, maximum, average) performs very well, and the performance of a fan chart appears to critically depend on the context in which it is seen.

- The decision context is crucial to the success of an illustration. People place more weight on information when it is presented in a format consistent with the choice format. Choosing among a range of funds is principally a non-numeric decision so people place more weight on narrative information, whereas choosing how much to contribute is

principally a numeric decision so people place more weight on numeric information.

- Loss aversion is a real and widespread phenomenon, but it is unclear whether information provision can ameliorate it. Studies of real world investing suggest that practitioners and regulators do not have the ability to influence members' loss aversion through information presentation that laboratory experiments indicate they do. The difference appears to be that in the real world people are affected by constant and random information arrival whereas in the laboratory researchers control both the information that people receive and the format. If individuals evaluate information as they receive it – a not unreasonable assumption, then laboratory and real world empirical techniques will continue to report different results for the power of information manipulation.

- Both conventional and behavioural economists propose that people's processing power is a scarce resource and that the best response is clear communication and a focus on 'teachable moments'. Conventional economists doubt the power of information manipulation more than behavioural economists, who are more optimistic about techniques for countering perceived biases in people's thinking.

- One potentially promising mode for further information is planning. People are more likely to translate their intentions into actions when they develop a plan, regardless of its sophistication. While planning appears to have a positive effect on wealth, not all people may be amenable to planning. Getting people to think about a plan at a basic level, at a 'teachable moment' may overcome some disinclination to plan due to personality or education. The more basic the initiative the more universal is the potential benefit and the less transferable the advantage from prior high inclination and education.

- A second promising area for further information is a high-level message directed to working people considering taking a pre-retirement cash lump sum. Demand for taking a pre-retirement cash lump sum and spending it

is greatest for those on less than median income, with lower levels of education, and those with small amounts saved. The government is addressing this cohort though auto-enrolment and employer duties, but they may also have specific information needs once enrolled and in their 50s and 60s.

◊ A third potential promising area is a pension projection that illustrates the variability which is both inherent in a long-range forecast and amenable to change by members, for example varying contributions, changing retirement date. If the principal aim of illustrating a pension projection is to connect variability with outcome and direct people to action, it does not follow that all measures which vary need do so within the illustration. Permitting all measures to vary may sow confusion and raise anxiety if some are not amenable to remedy. More research is needed on what variability is optimal to show and what action this may precipitate.

◊ The fourth potentially promising mode of information provision is a total pension forecast, consumer tested for usefulness, and linked to a clear, overt call to action. In a neighbouring domain, the asset-based welfare literature finds a positive relationship between the value of an owned asset and interest in the asset's growth and protection. By aggregating a number of lesser pension entitlements, a total combined forecast may assuage loss aversion through the portrayal of a larger and less variable headline figure. Not having finished their aspirations for total combined forecasts, regulators in the UK risk letting go one of the most promising information mechanisms for changing consumer retirement psychology.

◊ Evidence on the workplace as a 'teachable moment' is that generally this domain is not effective. There is scepticism about the employer as source of further information on pensions. Within the workplace, with or without employer involvement, it is hard to get non-pension savers to attend courses if they are voluntary, or pay attention to them if they are compulsory. More encouragingly, events do appear to have positive spillovers through word-of-mouth and peer group effects to non-attending colleagues. The effect may be more positive among low knowledge

individuals who rely more on word-of-mouth. A collective approach to seminars that is team-wide and part of the normal workday, with everyone downing tools, holds most promise. Ultimately, the evidence is that it is difficult to enforce a 'teachable moment' if people are not ready to engage in that moment.

◊ Promising 'teachable moments' have two contexts. The first is people's disposition to engage in the moment. The other is people's readiness to imagine. The latter postpones the inclination to overweight the present relative to the future and in doing so helps people value money today on a par with money tomorrow. The most promising 'teachable moments' appear to be where both the disposition to engage and people's propensity to imagine are coincident. This may be more likely to transpire at points of change when people consider their future selves and situation, for example a 30th, 40th or 50th birthday; start of a new job; or a shift in work pattern - from part-time to full-time or contract to permanent.

Questions in detail

Why is there interest in information provision?

In the move to DC, interest in information provision has coalesced around three broad areas:

1. Members are being asked to make important choices - including whether to participate, what level to contribute, when to take retirement, how to withdraw funds at retirement, and which funds to choose.

2. Compared to DB schemes, there are new risks for members of DC schemes - principally market, inflation, longevity, and conversion (into a retirement income), none of which are straightforward to understand.

3. Members, providers, administrators, and regulators need to share a common understanding of risk and expected return if attitudes and propensities to take risk and seek return by members are to be translated into appropriate investment decisions.

What high-level information gaps exist?

Surveys by Wilson (2008), Rinaldi and Giacomel (2008) and Rowlands (2009) report a lack of preparedness of people to deal with the risks that are transferred to them in the switch to DC workplace pension provision. A common solution put forward by respondents in Wilson's (2008) survey is **information that communicates better**. Benney (2004) argues that the supply of information must move away from the minimum information culture of defined benefit schemes. A prerequisite to informed decisions by members of DC schemes is **increased supply of information** (Benney, 2004). De Meza, Irlenbusch and Reyniers (2008) support **simple information** based on the potential for complexity to propagate confusion and investor passivity. Rinaldi and Giacomel (2008) similarly propose that communication be kept simple based on DC scheme providers and regulators having so far not

successfully conveyed to members the expected value of benefits and level of variability of entitlements using more general and untested information.

Larsson, Sunden and Settergren (2008) argue that providers of information need to develop their understanding of barriers and low incentives to processing pension information in order that they can be circumnavigated. Low incentives stem from product complexity, consumption of the product in the distant future, and the know-how needed to bring together the individual pieces of information in order to make overall sense of the pension picture. Barriers tend to be psychological; old age may be viewed as something unpleasant and a cause of worry, thoughts of taking a decision knowing that there is no second chance if it is wrong first time, and false preconceptions – e.g. the state will provide an adequate pension for you. DC scheme members can be helped through this complexity by **information that does not mislead and is complete**.

Purcell (2009) reports job turnover statistics that suggest many working people will be members of 7 to 8 DC schemes over their working years. Inhouse estimates by the National Employment Savings Trust find similar results for some cohorts of working people. If the messages workers receive from their different DC schemes are not consistent this may increase confusion, uncertainty and distrust (Purcell, 2009). This points to a role for **standardised information**. In a variety of applied situations, customers are observed as more likely to act on standardised information. For example, the literature on nutritional labelling shows that standardised information makes consumers more likely to use it to determine food quality, seek more nutritional information prior to purchase, and improve their overall decision quality (Roe, Levy and Derby, 1999; Ippolito and Mathios, 1990, 1994; Moorman, 1990, 1996). Standardised information also needs to avoid confusion that its introduction or revision is aimed to prevent. Significant concern was reported around Statutory Money Purchase Illustrations (SMPI) when they were first introduced, with Legal & General estimating that a 46-year-old woman with 18 years to go to retirement would see her estimated pension drop from £4,960 a year to just £2,030 a year (Benney, 2004).

How is information provision expected to influence consumer decision?

According to standard economics, individuals rationally process information to make choices that are optimal for them. Individuals are expected to use information more extensively if it costs less time and money to acquire it (Stigler, 1961; Nelson, 1970, 1974). The role for policy is therefore to provide better information in forms that are easy to work with and assimilate (De Meza et al, 2008). Standard economics predicts poor value for money from interventions designed to change the way people form financial decisions because people already have a mental economic decision model that generates rational outcomes. The area most amenable to information campaigns is likely to involve helping people reassess inputs into that thinking process - investment time horizon, required returns, how investment returns vary. Conventional economics acknowledges too that processing power is a scarce resource. Simon (1955) was one of the first to note the limitation of humans' computational capability. He coined the term "bounded rationality" in recognition that there are bounds on the ability of individuals to organise and utilise information. Communication that puts forward simple facts on separate narrow topics to assist action is consistent with conventional economics. Australian pension regulators pursue this approach, with one indicator of the regulator's success being more customer decision activity.

Behavioural economics takes as its starting point that psychology also matters. Behavioural economics amounts to a set of empirical findings rather than a theory or model (Olsen, 1998)[1]. These suggest that decision making is situational and contextual. Even if people know and understand the facts, they may still take poor decisions due to lack of self-control and other personality characteristics. This can generate decisions that are at odds to predictions from conventional economics. For example, introducing more accurate information may lead to worse outcomes. Lacko and Pappalardo (2004) show that a particular rewrite of mortgage disclosure information

[1] This limits it from a philosophy of science perspective.

designed to reveal broker compensation increased confusion about the total cost of a mortgage. More information deflected attention from what was really important. Kruschke and Johansen (1999) employ the term 'cue competition' to describe how the presence of irrelevant cues causes people to make less use of relevant cues. The role for DC pension information is to develop information that is sensitive to the psychology of the consumer (Barsky, Kimball, Juster and Shapiro, 1997; Nicholson, Fenton-O'Creevy, Soane and Willman, 2005; De Meza et al, 2008). As a result, behavioural economists have varying degrees of scepticism about the ability of simple information to bring about large scale change. UK pension regulators are increasingly taking a behavioural approach, the particular version of which sees investor passivity as a positive.

In practice, the two approaches, conventional and behavioural, are not mutually exclusive. One example is contemporaneous auto-enrolling (behavioural) and information targeted to individuals with a high opt-out propensity (better information). A second example is actively managed target date funds (behavioural) and information focused on encouraging members to actively select their expected retirement date (better information).

Will information provision increase pension saving but crowd out other saving or important expenditure?

In a UK sample of people who joined a workplace pension scheme as a condition of taking or remaining in a job with a particular employer, Green (1981) finds that pension saving has a positive effect on non-pension saving. In an earlier study, Cagan (1965) finds a positive effect of pension saving on non-pension saving. Gustman and Steinmeier (1999) find that the act of forming and sticking to a retirement saving plan does not encroach on other saving but rather fosters it. In a US sample, Venti and Wise (1990) report that workers saving in Individual Retirement Accounts (IRA) do not reduce their other saving and most of them had not saved much before IRAs were introduced. This evidence suggests that habit effects associated with saving

lead more pension saving not to crowd out other saving. Less is known about the effect of saving in a pension on the pattern of consumption, however if pension saving was compromising important expenditure presumably non-pension saving would be falling to pay for these items as saving in a pension is increasing – which evidence suggests it is not.

Does information provision benefit most customers with less information need?

Consumer research suggests a hump shape relationship between information search and knowledge (Bettman and Park, 1980). Experts have no need to carry out extensive information search because they already know a large amount. People with moderate knowledge and understanding engage most with information because their existing basic understanding allows them to more easily interpret and apply information as well as recognise the value of further information (Bettman and Park, 1980). For example, in the case of healthcare the middle class are found to benefit most from the National Health Service (Dixon, Le Grand, Henderson, Murray and Poteliakhoff, 2003), partly because their beliefs and literacy skills allow them to. In food retail, nutritional labelling is used more extensively by middle income and moderate knowledge consumers (Anderson and Zarkin, 1992; Prathiraja and Ariyawardana, 2003). Individuals with least knowledge confront the highest costs in becoming informed. They have most potential to benefit from information, but are least likely to draw upon it. The implication is that low knowledge individuals quickly become weighed down by a choice task and find the investment decision process overwhelming, regardless of communication efforts. An amount of both existing knowledge and education may be a precursor to further use of information.

How do high-level messages help?

High-level messages help people to a particular action, such as higher saving. People's pension saving behaviour may in part depend on attributes which are amenable to these financial rules of thumb. If so, drawing attention to

standardised, high-level messages may have a positive impact on aggregate workplace DC pension saving. Familiar non-investment examples include ‘smoking kills’, ‘eat five a day’, ‘don’t drink and drive’.

Messages for DC pension schemes might be promulgated that actively seek to influence key moments such as auto-enrolment, opt-out, changing contributions, taking a retirement lump sum early. One or more general messages on scepticism might also be developed regarding choosing a fund other than the provider’s default fund (presuming good default design), or making provision for a pension in a non-designated pension vehicle. Messages on scepticism sow doubt as a positive. General messages need to have a consistent language and be delivered at a high-level because job turnover statistics suggest people will be enrolled into a variety of schemes over their working years.

The key to the message is the delivery of an easily digestible slogan rather than the reason behind the advice the message gives. For example, a person auto-enrolled into a DC pension who is unfamiliar with saving in a pension scheme may have concerns around staying-in and continuing contributions. Their questions might include ‘is it safe?’, ‘can I afford it?’, ‘is it worth it?’ The general, high-level message may be - ‘it’s smart to save for people like you’. At a lower level each provider may give answers to the specific questions as they apply to their array of products. A second example might be questions around ‘where do I start?’, ‘how do I do this?’ The general, high-level message may be - ‘thinking about it helps it happen’. At a lower level there could be testimonials and stories of how a plan made a difference. A third example might be questions around “I don’t think I can afford to contribute?”, “if I stop contributing will it make a difference?” The general, high-level message may be - ‘it is better to keep saving – even at a lower level, than to stop altogether’.

The coordinated approach needed to execute this suggests central ownership, perhaps by government or combination of regulators who together have oversight of the entire DC pension scheme landscape.

Can information provision affect risk taking and fund choice?

Laboratory experiments have found that people are more willing to take investment risk if information about investment returns are reported in a periodic (i.e. less frequent) or aggregated (i.e. combined) format. This includes reporting to individuals long run return distributions of asset classes rather than one year return distributions (Benartzi and Thaler, 1999), portfolio return over n > 1 periods rather than returns in each n = 1 period (Gneezy and Potters, 1997; Thaler, Tversky, Kahneman and Schwartz, 1997; Gneezy, Kapteyn and Potters, 2003; Barron and Erev, 2003; Langer and Weber, 2008; Bellemare, Krause, Kröger and Zhang, 2005; Haigh and List, 2006; Sutter, 2007; Fellner and Sutter, 2009), and a combined portfolio return rather than returns for each individual asset separately (Anagol and Gamble, 2009).

Combining returns or collapsing multiple period returns into a single n > 1 period can reduce the occurrence of losses if returns are not perfectly correlated and have positive expected values. This can make an investment more attractive to a loss averse person than if each investment return was separately shown[2]. Using a different technique to examine loss aversion, Thaler et al (1997) find that if all return outcomes are increased enough to eliminate losses, investors are prepared to tolerate more risk[3]. In UK research, Goodman (2004) reports that of 22 different financial risks reported to working people, the most important risk factor was the possibility for a large loss in relation to money invested. Within a US sample, Olsen (1997) finds that the potential for loss is mentioned as the most important risk attribute twice as often as any other attribute.

The results above are consistent with investors suffering from myopic loss aversion (Benartzi and Thaler, 1995). The strength and consistency of the experimental results constitute strong evidence that myopic loss aversion, a combination of myopia - long run expectations formed from initial or recent

[2] This is a type of mental accounting.
[3] This may or may not be a nil return.

short run information, and loss aversion - a strong distaste for investment loss, is a real psychological phenomenon that responds to information presentation.

If myopic loss aversion does depress the willingness for members of DC schemes to take risk, to contribute more, or encourage people to opt out of pension saving altogether, this raises the possibility of presenting DC pension information in a way to overcome these potential behaviours. The laboratory evidence so far suggests that reporting combined and/or periodic aggregated returns will help do so (Benartzi and Thaler, 1995; Barberis, Huang and Santos, 2001; Barberis Huang, and Thaler, 2006).

One practical outcome of this is to show long run investment returns before short term investment returns. Larsson et al (2008) report international evidence that some pension statements now do so. A second practical outcome is to show a combined pension forecast including the state pension alongside one or more workplace pension entitlements, past and present. Larsson et al (2008) report that this is performed in Sweden. This may encourage greater risk taking because combining State and workplace entitlements into a single figure can reduce the occurrence of losses if returns to different entitlements are not perfectly correlated and have positive expected values. The presence of investment guarantees would be expected to have a similar presentational effect.

Do empirical laboratory results that point to benefits from information presentation hold in practice? Beshears, Choi, Laibson and Madrian (2011) take several steps closer to practice by having participants invest real dollars in mutual funds. They find, contrary to the previous experimental literature, that none of the information aggregations usually employed by researchers in a laboratory setting significantly increase portfolio risk taking in a more real setting. Seeing portfolio returns less frequently, seeing five year instead of one year return distributions, and having the ability to see returns of mixed portfolios, do not affect the average portfolio proportion allocated to equities. Opposite to expectations, Beshears et al (2011) find that a cohort of

participants – in particular those who do not go on to further education after leaving school, initially invest more in equities when they see asset class return distributions as opposed to a distribution of returns that result from holding a mix of assets. This is in contrast to evidence that distributions reveal uncertainty, or risk, which people are averse to.

What might explain the contrasting results between the laboratory and a framed field experiment? One possibility is that there is a substantial information gap between the laboratory and the actual investment environment. In the laboratory, researchers have complete control over information flows during the experiment. For example, in the behavioural finance models of Benartzi and Thaler (1995) and Barberis et al (2001), simply seeing returns does not cause investors to evaluate them. Investors receive utility from returns only when they sell a security or periodically evaluate returns at their choosing. However, financial market movements are daily news – at times headline, so the typical investor is likely to passively become aware of market returns in a manner that is involuntary and increasing with the amplitude of returns. Being aware of returns may cause people to evaluate performance more frequently than models presume.

Laboratory experiments tend also to be conducted over a single period and involve mostly student participants. The psychology of real risk taking outside the laboratory over days, months, or years may differ.

This closer-to-the-field evidence appears to suggest that practitioners and regulators do not have quite the ability to influence members through information presentation that Thaler et al (1997) suggest: “decisions made by employees covered by such [DC] plans may vary considerably depending on how their investment opportunities are described and the manner and frequency with which they receive feedback on their returns.”

The framed field evidence does not suggest that loss aversion is not real. Many behaviours in real settings are difficult to explain unless loss aversion is an important determinant of economic choices, for example the tendency to

sell stocks with paper gains and hold stocks with paper losses (Shefrin and Statman, 1985; Odean, 1998). It suggests only that in a real setting information arrival through the media may limit much of the potential for members of DC schemes to overcome loss aversion. One implication is that the information signal about DC pensions needs to be stronger so that it crowds out peripheral information. This may occur by increasing the proportion of total information delivering a consistent message i.e. standardised information, and raising its impact through high-level messages.

Do visual illustrations influence consumer decision?

Agnew and Szykman (2005) investigate pension illustrations by showing members of a DC pension scheme information on investment funds in table format and in narrative format. The researchers' expectation is that narrative information will be less useful for decision making due to the format's higher search cost - participants need to read and take in information across multiple pages. The investment knowledge of participants was also rated. The researchers find that high investment knowledge participants are statistically more inclined to make decisions based on table format information. Low investment knowledge participants are more inclined to make decisions based on narrative, booklet style information, though the strength of this relationship versus table format information is not statistically significant. The implications are that visual illustrations may be able to influence investment decision making of high knowledge members but not of low knowledge members, who feel an overload of information regardless of information type (Agnew and Szykman, 2005). This fits with findings from consumer research that information campaigns have greater impact on people who already have some knowledge and understanding (Bettman and Park, 1980).

Driver, Chater, Cheung, Latham, Lewis and Stott (2010) test the ability of participants to answer questions and select funds based on different types of investment risk illustration. Both narratives and tables perform well, but narratives are the only one of 14 types of investment information presented that score above average in all three measures tested.

Replacing a table with a bar chart reduces the likelihood that respondents will correctly answer questions. Bar charts may detract from decision making ability due to the numeracy and practical experience needed to interpret the scale of the chart, the quantification of the information, and the comparative nature of the data.

Driver et al (2010) and Gigerenzer and Hoffrage (1995) find that people are able to interpret frequencies more accurately than probabilities. De Meza et al (2008) argue that regulators should encourage the use of frequencies rather than probabilities and train illustrators to translate probabilities into frequency formats.

Roulston and Kaplan (2009) find fan charts have proved helpful in getting people to understand forecast risk. Driver et al (2010) report mixed results for fan charts. The addition of a fan chart seems to have a positive impact on perceptions of reward, but its inclusion alongside other means of illustration seems to neither raise nor lower participants' ability to correctly answer questions or perform decision tasks better (Driver et al, 2010). Participants rate fan charts both really useful and not easy to use. Driver et al (2010) conclude that of all the illustrations of risk shown to participants, a thermometer illustration of investment fund risk – with the level on the thermometer increasing with investment risk, performs best.

Other research indicates an association between the type of decision and the type of information e.g. narrative, numeric, graphical. For example, Olsen (1999) provides evidence that people place more weight on information that is presented in a format consistent with the choice format. Choosing from a range of funds is principally a non-numeric decision so people place more weight on narrative information, whereas choosing how much to contribute is principally a numeric decision so people place more weight on numeric information (Olsen, 1999). Thus, the fan charts illustrated in Driver et al (2010) may perform less well in their study of fund choice because people do not consider this to be a numeric decision. Their performance may improve in

a more numeric decision environment. Olsen (1999) also reports that people give greater weight to non-numeric information as numeric information becomes more ambiguous, suggesting that the narrative or numeric decision is second to the need to illustrate clearly.

Goodman (2004) reports on an experiment involving the evaluation of 11 types of investment risk illustration within a sample of working people. The highest scoring risk illustration was a range that presented 3 values; a minimum, a maximum, and an average. This was not presented as a chart. Equal second and third in importance was a statement that gave the percent chance of getting your money back i.e. a nil return, and a chart of a frequency distribution (discrete not continuous) of possible retirement incomes obtained from investment in a fund (Goodman, 2004). Charts showing the frequency distribution of possible retirement incomes are not dissimilar to fan charts, so this lends support to findings of Roulston and Kaplan (2009) and Driver et al (2010) that fan charts have value[4]. Experimental work finds that out of 22 different risk factors shown to participants, loss, nil investment return, and a low income in retirement were the three most important. These were more important than lack of trust, confidence, and knowledge and understanding (Goodman, 2004).

In their study of portfolio choice based on the display of information and visual ordering, Benartzi and Thaler (2002) find that most participants do not have the skills or information available to pick portfolios that line up with their risk attitudes. People's preferences are at times confused, especially when choice problems are hard, leading people to often (sensibly) resort to simple rules of thumb to help them cope. In a laboratory setting, this makes them sensitive to the order in which information is presented. Thus, information that increases decision making may not help if those decisions are in part based on the array of choice and how they were visually presented.

[4] Fan charts are not universally popular. The Financial Services Authority dislikes fan charts based on the expectation they are difficult to interpret by individuals with average levels of financial literacy.

How to communicate information effectively to those who need it most is a challenge that extends well beyond investment. This review does not consider illustrations of risk information employed outside of investment, though other literatures do exist, for example Lusardi (2008) reports that the health literature places increasing reliance on testimonials and stories rather than on figures and hard data.

If information was to encourage someone to begin thinking about planning, would he or she end up with a larger amount of wealth because of it?

Some researchers believe that a promising and simple way to ease people into greater retirement saving is to get them to think about planning. This belief has origins in evidence that planning has a positive effect on wealth. Lusardi (2008) finds that planners have substantially more wealth than non-planners, with planners on average accumulating more than double the amount of wealth of non-planners. Lusardi and Mitchell (2007a) find evidence that the direction of causality goes from planning to wealth rather than from wealth to planning. Lusardi and Mitchell (2006, 2007a), and Lusardi, Keller and keller (2007) find that planning continues to be a determinant of wealth even after accounting for many other reasons why wealth may be low.

Not all people may be amenable to planning. People with low educational attainment appear to have more difficulty planning ahead, with Mischel and Metzner (1962) finding that higher time discounting correlates with lower intelligence quotient (IQ). A person's personality may not lend itself to planning, for example even among people with high educational attainment there is a sizable fraction of non-planners (Ameriks, Caplin and Leahy, 2003; Hurst, 2006).

Keeping the planning message simple and high-level should alleviate at least some of the disinclination to plan due to education and personality. This might mean getting people to think about a plan regardless of how basic that thinking is.

Lusardi, Keller and Keller (2007) devised a retirement planning tool that breaks down the retirement planning process into several small steps, described what participants need to do, and contains pictures and messages designed to motivate participants to save. The researchers report that contribution rates tripled after the introduction of the planning aid. Drawing on the psychological literature to explain how basic planning might affect wealth, Gollwitzer (1996, 1999) shows that people are more likely to achieve goals and translate their intentions into actions when they develop a plan, regardless of its sophistication. A simple planning activity, such as getting people to write down the specific steps they will take to implement a task, can greatly increase implementation (Gollwitzer, 1996, 1999). Basic thinking around planning creates a thought process that makes it more likely that action will, at some future point, occur. This approach may be especially fruitful given evidence that as many as three-quarters of workers have little idea how much money they need to accumulate for retirement (Yakoboski and Klemperer, 1997).

A basic planning initiative may benefit from being introduced when people have greater disposition to make decisions, for example the start of a new job makes people think about saving and a pension. Choi, Laibson and Madrian (2006) and Lusardi, Keller and Keller (2007) find that at job commencement people are particularly open to making changes. Many people do not think about retirement even at an advanced age so it may be important to exploit 'teachable moments' (Lusardi, 2008).

De Meza et al (2008) doubt the existence of a causal link between planning and wealth, although they accept that the confidence interval is wide so it cannot be rejected that there is a large effect. Their doubt is based on the premise that educational attainment, or financial capability, leads to better planning that leads to higher wealth. There is confirming evidence for this view (e.g. Chatterjee and Zahirovic-Herbert, 2010; Lusardi and Mitchell, 2006, 2007b, 2009). This indicates that any deliberative initiative needs to exploit as far as possible the planning – wealth link and disconnect the education link.

The more basic the initiative and simple the steps the more that prior education and inclination are likely to represent a transferable advantage.

What variability is currently illustrated in pension projections?

A pension projection aims to illustrate the income a member's fund might buy them in retirement on a consistent basis across different DC schemes. Variability is inherent in a long term projection, but what are the regulatory approaches to illustrating this?

One approach is to assume away all variation by projecting a single amount according to prescribed fixed inputs[5]. The principal criticism is that a single projection disconnects future income from the variation inherent in the forecast. It takes across the idea from DB pensions that there is no risk to the member. There also remains the risk that some members may perceive the projection as 'actual' or 'guaranteed' (FSA, 2002a).

A second approach is to allow one or more measures to vary, for example varying asset class and investment returns, retirement date, annuity rates, inflation rates, and contributions. If the aim of the illustration is to connect variability with outcome it does not follow that all measures that can vary need do so within the illustration.

In Chile and Mexico, where periods of unemployment or informal employment are common and lead to irregular contribution flows, attention is paid to contribution density, with projections based on different, incomplete, contribution records (Rinaldi and Giacomel, 2008).

In Italy, projections are determined through the application of asset class returns set by regulators. Forecast returns are then applied to the allocation of bonds, equities etc within the investment benchmark adopted by each pension provider. The application of different benchmarks by providers

[5] This simple technique can be surprisingly powerful if the aim is to compare charge and cost between products and providers. This is because a projection quoted after-cost makes clear to members the charging structure of different providers.

creates cross-sectional variation in projections among DC providers. There is some concern that different provider projections may spark a “competition in optimism” that leads to benchmarks based on only higher returning assets, perhaps to the detriment of protecting consumers (FSA, 2002a, 2002b; Rinaldi and Giacomel, 2008). Some regulators conclude that projections should not promulgate competition among providers.

The UK illustrates variability by prescribing three rates of investment return, 5% (low), 7% (intermediate) and 9% (high). The Financial Services Authority (FSA) permits providers to report more than 3 projections, provided none exceed the 9% higher rate. Providers have so far refrained from doing so. A decade ago, in 2001, FSA rules explicitly permitted pension projections to also be issued using lower real rates of return at 1% and 3%. Industry did not use these options, so in 2002 the FSA proposed to, and subsequently did, remove the option to illustrate at 1% and 3% real rates of return (FSA, 2002a, 2002b).

One difficulty with the fixed projections applied in the UK is that the uncertainty they allude to is completely arbitrary. A 9% return is seemingly achieved at no greater expected or realised risk than a 5% return. The returns selected do not constitute a logic e.g. a minimum, maximum, median or even interquartile range. Indeed, the FSA does not prescribe illustrating based on a total range, fearing that a member may be so alarmed by a low projection that it is felt saving any further will not do any good, or that a high projection may lead to thinking that saving can be undertaken with less earnest (FSA, 2002a, 2002b; Rinaldi and Giacomel, 2008). Goodman (2004) suggests that it would make more sense to show a minimum, maximum and median to customers, but clearly this commits the regulator to indicating the whole range of outcomes members can expect, which so far it has been averse to.

The examples above provide some weak evidence that the illustration of variability inherent in pension projections does concentrate on aspects that are amenable to change by members.

None of the examples above necessitate a stochastic projection. If the aim of a visual illustration is to convey to members the existence of variability, or perhaps an expected range of outcomes, stochastic and deterministic models can perform either task satisfactorily. Only when the aim is to attach a likelihood, or probability, will this necessitate a stochastic projection. In the UK, stochastic projections can be used as well as deterministic projections but firms have so far not employed them. There is no evidence that regulators require these in any jurisdiction, though there are reports of increasing interest (Rinaldi and Giacomel, 2008).

In the production of a stochastic projection, outputs can be presented as a range and/or a likelihood of the amounts being achieved in absolute money terms or in the form of a chance of equalling or exceeding a particular pension amount.

One difficulty with stochastic projections is that they may introduce unintended uncertainty. If stochastic projections are made for an individual wishing to target a pension of £10,000 at retirement, assuming investment in a mixed fund, the model might show that based on the assumptions the pension at retirement has "62% chance of exceeding £10,000 and an expected value of £14,500". If the projections are subsequently made again, the model might show the pension at retirement has "68% chance of exceeding £10,000 and an expected value of £10,900" (FSA, 2002a, 2002b). It may be difficult for consumers to make sense of both a changing probability and retirement amount. The precision they impart is probably quite illusory. There is concern that stochastic projections could cause a wrong decision and consumer detriment unless a regulator provides a framework within which unreasonable projections cannot be given.

Is the workplace a 'teachable moment' for stimulating retirement saving?

This question has two contexts. One concerns whether the employer is the right information provider. The other concerns whether the workplace is the right location.

The concept of working people receiving additional information about pensions from their employer gained the least support among respondents to the International Institute of Banking and Financial Services Financial Well-being Survey (2004), with only four out of ten agreeing or strongly agreeing that their employer should give them more information about saving for retirement. Women were significantly more favourably disposed to this source of information than men, with 45.8% of women agreeing or strongly agreeing that their employer should give them more information about saving for retirement, compared to 31.7% of men.

Summers (2005) casts doubt on the employer as a source of pension communication One reason given is that fragmented careers intensify job insecurity and make employees' less sure of the value and commitment of their employer's involvement. A second reason given is that recent problems with company pension schemes may dilute the pension's message and lead employees to view with suspicion additional employer involvement, with a company pension perceived as more of a risk than a benefit. Last, employer encouragement may lead to a sense that employees are being persuaded to join the company pension scheme, which sows further suspicion.

Much of the evidence on the workplace as a location for information provision concerns the impact of interventions. Typically these involve a pension information event, such as an information fair or a seminar. The evidence is that these interventions generally do not work, although there are positive, indirect effects. Bernheim and Garrett (2003) argue that seminars are often targeted at workers with little or no saving, thus the effects of seminars may have been underestimated.

Clark and D'Ambrosio (2007) find that a significant minority of participants were affected by workplace seminars but that this influence tended not to

translate into action. When interviewed several months later, many of those reporting an influence had not changed behaviour. Indecisiveness appears to be rife. Choi, Laibson, Madrian and Metrick (2001, 2004) and Choi et al (2006) report similar findings on workplace seminars.

Duflo and Saez (2003) find increased participation in pension schemes by both attendees and non-attendees following a pension's event. The effect on saving was insignificant. The affirmative results are explained by word-of-mouth and peer effects (Duflo and Saez, 2004; Duflo, Orszag and Saez, 2005; Madrian and Shea, 2001). There is strong evidence that investment in complex assets, such as stocks, is affected by word of mouth, including the advice of neighbours and fellow church-goers (Hong, Kubik and Stein, 2004; Brown, Ivkovich, Smith and Weisbenner, 2007). Social effects, such as pressures to conform can exert a powerful influence, with many people engaged in a constant search for cues about how they are supposed to behave (Loomes and Sugden, 1999). Van Rooij, Lusardi and Alessie (2007) show that low knowledge individuals are disproportionately more likely to rely on family and friends for financial advice, while more financially sophisticated individuals are more likely to rely on newspapers, books, and the Internet.

Rabin and O'Donoghue (1998) suggest a collective approach to seminars that is team-wide and part of the normal workday, with everyone downing tools, holds most promise. This collective approach is used in other domains. For example, some hospitals have set up "centres for shared decision-making" to help patients make decisions about medical treatments.

Overall, results seem to suggest that it is difficult to enforce a 'teachable moment' if people are not ready engage in that moment. Behavioural economics also suggests that it will be hard to get people to attend courses if they are voluntary, or pay attention to them if they are compulsory. The costs are immediate, the benefits uncertain. Usefulness seems to entail the moment being meaningful for the individual rather than convenient for the messenger.

Do working people inquiring about a pre-retirement cash lump sum have a specific information need?

Many members of DC schemes have the facility to access up to one quarter of the value of their current DC pension entitlement at 55 years of age while continuing both in employment and to accumulate benefits and contribute with their employer[6]. Will cash intended for retirement and its availability 15 years or so prior, risk a disconnect between its availability and its intended purpose? What is the propensity to take a lump sum pre-retirement, and will it be spent – reducing household worth, or saved – maintaining household net worth?

In the US, workers may opt to receive a lump sum when they change jobs or leave employment rather than keep the balance in the former employer's scheme (Purcell, 2009). Between 1980 and 2006, 13.9 million workers under the age of 60 took one or more pre-retirement lump sums (Purcell, 2009). 45.2% of these (6.3 million people) rolled over the entire distribution into an Individual Retirement Account (IRA) or subsequent employer retirement plan. 54.8% (7.6 million people) took some or all the lump sum out of retirement saving as cash to save elsewhere or spend. Cash lump sums taken prior to age 59 incur regular income tax plus an additional 10% tax on the amount taken out of retirement savings. The statistics above therefore reveal the demand for pre-retirement cash lump sums in the presence of a tax penalty. The propensity to take a pre-retirement cash lump sum when it is free of tax, as in the UK, could well be greater for at least certain cohorts.

Purcell (2009) investigates the determinants of taking a pre-retirement cash lump sum. One-quarter of the 7.6 million people (1.8 million people) who took a cash lump sum prior to age 59 spent it in ways that reduced household net worth i.e. on consumption. The true proportion spending rather than saving a lump sum may be higher due to the self-reporting of this figure. The most important determinant of taking a lump sum early was the lump sum amount, with small amounts more likely to be taken early (374% more likely than not

[6] This was not so freely available in DB schemes.

taking a lump sum early). The second most significant determinant is not having gone onto further education after leaving school (170% more likely). The third most significant determinant is income, with people earning less than median income twice as likely to take a lump sum early (112% more likely). Men are 20 percent more likely to take a lump sum early than women, and those not re-employed 35% more likely. The regression results above for those taking a pre-retirement cash lump sum do not separate out those that 'saved' from those that 'spent'.

These results suggest that the propensity to take pre-retirement cash lump sums is greatest for cohorts that will be most affected by UK workplace pension scheme auto-enrolment – those on less than median income, with lower levels of education, and those with small amounts saved. A targeted information campaign may be promising here. Information provision could focus on promulgating general, high-level messages targeted around taking a pre-retirement cash lump sum. The general slogan might be to get people to stop and think, with the aim of sowing scepticism that spending income intended for retirement is the appropriate course of action. 'Consider what would happen if' encourages people to think again and counteract the tendency to value money today more than money tomorrow.

Evidence of people switching money between pension saving, non-pension saving and current expenditure seems to suggest that at least some people seem less prone to mental accounting than presumed.

What is the value of a total combined pension forecast?

A consolidated, or total combined pension forecast, provides a fuller picture of future retirement income by bringing together the benefits from different pension sources, for example the state pension and a workplace pension scheme. It is a potentially important means of enabling members to assess their overall retirement situation. A total combined forecast helps people read across their different pension entitlements to assist them plan and develop a

stronger sense that saving is worthwhile. Three sets of evidence underpin production of a total combined pension forecast.

The asset-based welfare literature finds that awareness and ownership of an asset of value changes people psychologically and encourages greater care and interest in the asset's growth and protection (for example Cramer, 2007; Sherraden, 1990; Shapiro and Wolff, 2001; Gregory and Drakeford, 2006). Under separate reporting, each pension entitlement may on its own be so insignificant that it effectively releases the mind from caring about it. If mental accounting holds, people already have a propensity to partition different entitlements – they need help to bring them together not keep them apart.

Second, a combined forecast can address loss aversion. Combining State and workplace entitlements into a single figure can reduce the occurrence of losses if returns to different entitlements are not perfectly correlated and have positive expected values. Empirical experimental research by Thaler et al (1997) finds that if all investment return outcomes are increased enough to eliminate losses, investors tolerate more risk and become more accepting of the potential for loss.

Last, a combined forecast gets close to a clear, overt call to action. Empirical evidence suggests that savers value a forecast that pulls together all their pension entitlements (Bunt, Adams and Mottram, 2004; Sykes, Hedges and Kelly, 2008; Kelly, Linsdell and Scanlon, 2005; Summers et al, 2005). Research for the ABI finds that one total figure is the best potential call to action and not an illustration that leaves the various elements split-out but on one page (Middleditch, Burns, Elwood, Bower and Brown, 2006). One total figure also links to, and lends more encouragement to, a planning mindset (Middleditch et al, 2006).

In the early 2000s, the Department for Work and Pensions (DWP) commenced work on more than one combined forecast initiative. One was the Combined Pension Forecast (CPF). A CPF provides a personalised combined forecast of workplace and State pension entitlement. The DWP

encouraged employers and pension providers to participate in this voluntary initiative. In the Pensions Act 2004, the Government secured reserve powers to require trustees and managers of private or company pension schemes to issue CPFs should it not secure the support it was seeking. Section 237 of the Pensions Act is to "require the trustees or managers of an occupational or personal pension scheme to provide any member of the scheme" with a Combined Pension Forecast. Section 238 is to "require employers to take action for the purpose of enabling employees to obtain information and advice about pensions and saving for retirement".

The DWP also intended an Online Retirement Planner (ORP) to enable people to view "all their pension information together from both State and private sources" and to "identify and trace any 'lost' pensions", and to use online tools to calculate any shortfall that they may face in retirement income based on what they can expect and what they need (see Summers et al, 2005).

Progress has stalled on both initiatives and they remain unfinished business. The move to workplace personal pensions significantly reduces the future chances of combined forecasts as a voluntary initiative. This is because workplace personal pensions help companies to lighten their human resource departments through outsourcing pension administration. Smaller corporate pension departments make it less likely that an employer will request a CPF, either from the DWP or from the scheme administrator, which they need to do on behalf of the member.

A potentially promising mode of information provision is for the DWP to refresh and firm-up aspirations around a total forecast and link this to consumer testing of usefulness and a clear, overt call to action.

How are DC regulators expected to appraise the information environment?

The literature on the market for information expects that three questions will direct regulators in their evaluation of the adequacy of the information environment for DC members (Gonedes, 1976; Keane, 1983; Barker, 1998):

1. What information mechanisms are currently in place whereby members can make fully informed decisions?
2. Is the information provided by these mechanisms likely to be correctly processed?
3. Is regulatory intervention likely to move members closer to a point where they can be fully informed and make appropriate pension saving and retirement decisions?

Information mechanisms

Information mechanisms have not kept pace with the rapid growth in the membership of DC schemes. This has triggered information gaps. For example, currently there is no standardised, comparable illustrations of costs and charges that show to customers' value for money from providers - the services they receive for every penny in the pound the scheme provider takes as charges. As well as gaps, some existing mechanisms were introduced without consumer testing of effectiveness, for example Automatic Pension Forecasts, Statutory Money Purchase Illustrations (SMPIs), and Combined Pension Forecasts (CPF).

Information processing

Regulators mostly adopt a conventional or behavioural economics viewpoint as to how individuals process information. Conventional economics puts forward that better decisions come about when information is presented in forms that are unbiased and easy to work with and assimilate. Behavioural economics has so far been directed more at explaining decisions than to changing them, but a growing literature focuses on techniques for directing information to counter perceived biases.

Regulatory intervention

Even if there is a sense in which information is inadequate and people can be shown to be making poor decisions, it will likely be debatable whether it is appropriate to try to intervene. Regulatory intervention to achieve good institutional design and information dissemination may not move consumers closer to a point where they can be fully informed and make appropriate pension saving and retirement decisions.

As regulators work through these questions, different approaches to DC pension information arise. For example, in a study of the regulatory provision of annual pension benefit statements and projections, Larsson et al (2008) find that one group of countries provide a historic statement only (Larsson et al, 2008). A second group mixes historic statements and projections, with some presenting projections followed by historic statements based on greater salience being attached to first shown information (Larsson et al, 2008; Antolin, 2008). A third group of countries present information conditional upon age, with younger people receiving less information based on regulatory scepticism as to its affirmative impact[7]. A fourth group of countries aim for brevity of information - presenting historic and forecast aspects on one page in order to remedy a perceived short-term cognitive bias. A final group of countries design DC pension information to both fully inform and thereby lower requests for further information and administrative burden (Larsson et al, 2008).

How is the pension section of employer and pension scheme websites used?

A 2004 workplace pension survey carried out by the Chartered Institute of Personnel and Development and covering 572 employer organisations found that less than half of employers used the staff intranet to communicate pensions. Key employer pension communication instead tended to be paper based and delivered in the staff handbook and induction process. In a

[7] Larsson, Sunden and Settergren (2008) cite the example of Finland, where people over the age of 50 receive a projection, while people under this age do not receive any projection. This reflects concern that the high inaccuracy of projections many years away from retirement may be misinterpreted and possibly taken as a disincentive to work.

separate study of DC pension scheme websites, Westbroom (2004) reports that the main use of pension scheme websites is to obtain general information, downloadable forms, reports and reference material. Only one in eight of the websites contain general savings information. While DC scheme websites provide the opportunity for members to redirect contributions, switch funds, change contribution rate and change lifestyling age, for users these actions were of secondary importance to its use as an information system.

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