

Open Research Online

The Open University's repository of research publications and other research outputs

Individual Investment Behaviour: A Brief Review Of Research

Other

How to cite:

Collard, Sharon (2009). Individual Investment Behaviour: A Brief Review Of Research. Personal Accounts Delivery Authority.

For guidance on citations see [FAQs](#).

© 2009 The Author

Version: Version of Record

Link(s) to article on publisher's website:

<http://www.nestpensions.org.uk/schemeweb/NestWeb/includes/public/docs/investment-consultation-research-report,PDF.pdf>

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

oro.open.ac.uk


Individual investment behaviour: A brief review of research

Sharon Collard
Personal Finance Research Centre
University of Bristol


Final report
January 2009

Point of contact:

Sharon Collard
Personal Finance Research Centre
School of Geographical Sciences
University Road
Bristol
BS8 1SS

 0117 954 6856

 s.collard@bristol.ac.uk

 www.pfrc.bris.ac.uk

The author	i
Executive summary.....	i
1 Introduction.....	1
1.1 Summary of research that has been reviewed.....	1
2 Understanding of and attitudes to investment risk.....	3
2.1 Attitudes to risk.....	3
2.1.1 Gender differences in attitudes to risk	4
2.2 Summary of key points	5
3 Behaviour in relation to investment choice	6
3.1 Choice and information overload.....	6
3.2 Unstable or undefined preferences.....	7
3.3 Heuristic decision making (rules of thumb).....	7
3.4 Framing effects and investment menu design.....	7
3.5 Procrastination and inertia	8
3.6 Overconfidence	8
3.7 Consumer lack of understanding and knowledge	8
3.8 Summary of key points	9
4 Pension fund choices.....	10
4.1 Number of investment fund options	10
4.2 How do people make investment choices?	11
4.2.1 Use of advice in pension purchase.....	12
4.3 What types of pension funds do people choose?	13
4.3.1 Asset allocation and personal characteristics.....	14
4.4 Do people switch investment funds?	15
4.5 Do people make active investment choices or stay in a default fund?	16
4.6 Summary of key points	17
5 Pension savings adequacy.....	19
5.1 Summary of key points	20
6 Conclusions.....	21
6.1 Do people make investment decisions that are too conservative to meet their intended objectives?.....	21
6.2 What is the likelihood of pension scheme members switching investment funds over time? Is there any evidence that people switching between pension funds do not make sensible investment choices, given their personal and household circumstances?	22
6.3 In the context of the personal accounts scheme, what is the evidence around individuals' likelihood of making an active investment choice rather than staying in the default fund?	22
7 References.....	24
Annex 1: Full list of references.....	28

Views expressed in this report are not necessarily those of the Personal Accounts Delivery Authority, the Department for Work and Pensions or any other government department.

The author

Sharon Collard is Senior Research Fellow and Deputy Director of the Personal Finance Research Centre, an independent research centre based at the University of Bristol. She is co-author of a publication on attitudes towards investment choice and risk within the personal accounts scheme, which reports the findings of qualitative research commissioned by the Department for Work and Pensions.

Executive summary

This brief review of research was carried out to inform whether the Personal Accounts Delivery Authority (PADA) should be making decisions for its members with regard to pension fund choices. The findings are based on a review of around 80 items, mostly involving research carried out in the US and UK. The body of evidence mainly comes from the discipline of economics and the field of behavioural economics in particular. Survey data was the most common type of evidence, but the review included qualitative research as well.

Key messages

The key messages for the Personal Accounts Delivery Authority are outlined below, with reference to the specific questions set out in the research specification.

Do people make investment decisions that are too conservative to meet their intended objectives?

The research evidence indicates a widespread lack of knowledge and understanding about pensions and investment choice. In addition, UK consumers (and women in particular) are generally found to be risk averse (section 2). In keeping with this, consumers have been found to focus more on minimising financial losses than maximising financial gains, even when making decisions about long-term investments such as a pension (section 4.2).

Faced with complex investment choices, there is evidence that people use what are called ‘naïve diversification strategies’ (e.g. they may divide their pension contribution equally among the number of funds offered by a plan), which may result in sub-optimal decisions (i.e. less favourable or desirable decisions) with regard to their potential income in retirement. Individuals’ investment decisions are also strongly influenced by the number and mix of investment choices that are offered (known as framing effects), highlighting the importance of pension plan design in achieving desired outcomes (section 4.2).

Giving people pension fund choice appears to encourage investment in equity funds and international evidence from mandatory individual account pension schemes reveals a general preference among participants for equity funds. This may result from factors such as framing effects, the use of ‘rules of thumb’ by consumers to make investment decisions or the professional advice that consumers receive (section 4.3).

Other research indicates that the picture regarding participants’ apparent preference for equities is not clear cut. There is evidence from the US that allocation to equities is polarised between those participants who have no allocation to equities and those who have invested entirely in equities. Moreover, allocation to equities has been shown to decrease with the number of investment options offered (section 4.3).

In recent qualitative research conducted with people in the target group for automatic enrolment under the UK Government's workplace pension reforms, participants mainly expressed interest in investing in lower-risk pension funds (section 4.3).

While there is evidence of a positive link between income and equity asset allocation in pension plans (with higher equity allocations among higher earners), studies in the US and Sweden indicate that the differences are not great. This suggests that some participants on lower incomes may have poorly diversified portfolios and be over-exposed to risk. One explanation might be that these participants expect to have other resources in retirement, such as a state guaranteed minimum income, and so have little to lose by taking risks. Similar behaviour has been seen among people who have a defined benefit pension plan as well as a defined contribution plan (section 4.3.1).

What is the likelihood of pension scheme members switching investment funds over time? Is there any evidence that people switching between pension funds do not make sensible investment choices, given their personal and household circumstances?

The evidence shows a general trend of low levels of investment fund switching by pension plan participants. Evidence from the US and Sweden indicates that fewer than two in ten pension plan members switched funds on at least one occasion in 2007. There is some evidence to suggest that providing information does little to encourage fund switching or rebalancing (section 4.4).

There seems to be very little data about whether or not people make sensible choices when switching funds. One study in Australia highlighted problems with the advice provided to superannuation scheme members around fund switching, which involved advice to switch to higher fee funds with no countervailing benefits or the loss of important insurance cover (section 4.2.1).

In the context of the personal accounts scheme, what is the evidence around individuals' likelihood of making an active investment choice rather than staying in the default fund?

There is considerable variation in levels of active decision making between countries that operate mandatory individual account pension schemes. On the whole, international evidence seems to support the notion that a large number of investment options can cause information overload, resulting in confusion among scheme participants and greater use of default funds. As a result countries (such as Central and East European countries and Hong Kong) that offer limited investment choice seem to have much higher levels of people making an active choice (over 80 per cent in some countries). In contrast, countries offering a wide choice of pension investment funds (US, Sweden, Australia) tend to have lower levels of people making active choices and correspondingly higher proportions of people enrolled in the default options (section 4.5).

One study in the US found that between 65 and 87 per cent of new participants saved at least temporarily in the default fund and at the default contribution rate, and a significant proportion (45 per cent) continued to do so three years later. The generally conservative nature of default investment funds combined with low default contribution rates has raised concerns about the possible sub-optimal outcome for these plan members (section 4.5).

In Sweden, overall figures show that 58 per cent of pension savers have made an active choice, but this masks a rapid decline in the proportion doing so over time, from 67 per cent when the scheme was introduced in 2000, to 1.6 per cent in 2007. It is notable that during the period 2001-2005, the Swedish default fund performed better than an average of all funds that could be actively chosen, and was considerably cheaper. The continued decline in active decision making between 2006 and 2007 is partly attributed to a change in the communications strategy, whereby scheme members no longer automatically receive information about their investment fund options (section 4.5).

Evidence (for example from Peru) also suggests that default funds that have low charges and perform well can result in low levels of active investment choice (section 4.5).

In qualitative research in the UK around proposed pension reforms, most participants said they would personally want to make an active investment choice if they were automatically enrolled into a workplace pension scheme.¹ This was largely driven by a desire to have personal control over the level of investment risk. Adequate information was considered crucial if individuals were to make an investment choice, including clear explanations of the different levels of risk associated with investment funds (section 4.5).

Other key findings

Understanding of and attitudes to investment risk (section 2)

- Attitudes to risk depend on a wide variety of factors including age, income and wealth, gender, marital status, personality, educational attainment, and level of financial knowledge and experience.
- There is fairly consistent evidence that women are more risk-averse than men in their attitudes and behaviours towards investment decisions. Some studies argue that factors such as marital status, wealth and income, play a bigger role than gender in explaining these different attitudes to risk
- Attitudes to risk change over time. Willingness to take financial risk tends to decrease significantly among people at or near retirement. Research on measuring investors' appetite for risk suggests that it falls sharply during economic crises.

Number of investment fund options (section 4.1)

- The extent of investment fund choice varies widely across the mandatory individual account pension schemes that operate worldwide. The greatest choice is seen in the US, Sweden and Australia.
- US evidence indicates that increased investment fund choice reduces rather than increases the likelihood of participation in retirement savings plans, which supports the notion of choice and information overload.
- In qualitative research in the UK with the target group for automatic enrolment, participants considered that between three and five investment funds was a manageable number to choose from.

Information and education

¹ Though previous research indicates that people tend to be overly optimistic about taking action

- Evidence from the US suggests that information provision and financial education has a limited impact on individual behaviour in relation to making investment fund choices (section 4.2) and fund switching (section 4.4).
- In Sweden, however, the communications strategy adopted by the mandatory pension scheme seems to have had a considerable impact on levels of active decision making (section 4.5).
- While many people may rely on professional financial advice to make pension purchase and investment decisions, research from the UK and Australia has highlighted concerns about the quality of advice provided to individuals (section 4.2.1).

Pension savings adequacy (section 5)

- Many adults in the US and UK are not confident that they are saving enough for their retirement and these concerns are borne out by analysis of actual pension savings adequacy.
- On the whole, individuals with a private pension are likely to have greater levels of pension wealth or other financial resources to fund their retirement than those who do not.

1 Introduction

The main research objective of this research review was to examine whether there is any evidence to inform whether the Personal Accounts Delivery Authority (PADA) should be making decisions for its members with regard to pension fund choices.

The specific research questions for the review were as follows:

1. What literature has been written about individuals' behaviour when making investment choices?
2. What are the key findings from this literature (in summary)?
3. What does the literature tell us about people making investment decisions that are too conservative to meet their intended objectives? For example is there evidence that:
 - a. People do not take enough risk to achieve their desired outcome; or
 - b. People do not take into account other assets they may hold when making investment decisions?
4. Is there any evidence that people switching between pension funds do not make sensible investment choices given their personal and household circumstances?
5. In the context of the personal accounts scheme, what is the evidence around individuals' likelihood of actually making an active investment choice versus staying in the default fund, and whether they will switch funds during their time as a member of the scheme?

The main focus of the review was investment behaviour in relation to pensions, and this is reflected in the research that was identified.

As the timetable for the review was short, a systematic literature review was not feasible. Instead a brief research review was conducted to identify key research findings relevant to the specific research questions. This comprised two elements: first, a review of bibliographic databases including the International Bibliography of the Social Sciences and Google Scholar; and secondly, a review of research carried out by government departments, regulators and trade bodies including organisations such as the Department for Work and Pensions, the Financial Services Authority and the Association of British Insurers.

1.1 Summary of research that has been reviewed

In total, around 80 items were identified as being relevant to the aims and objectives of this review. Most of these items were pension-specific, while the rest relate to financial risk or investments more generally. Most of the research evidence comes from the US or the UK, with some additional material from Australia, Sweden and the Netherlands.

As we might expect, most of the research literature comes from the discipline of economics. In particular, there is a considerable body of work on individual investment behaviour from the field of behavioural economics. Survey data was by far the most common type of research evidence, and included both continuous surveys such as the English Longitudinal Study of Ageing and the Survey of Consumer Finances (US), and bespoke surveys commissioned for particular studies. Other sources of research evidence included administrative data (e.g. from employer pension plans), experimental studies, qualitative data and official statistics.

The research we have identified falls in the following categories:

- Understanding of and attitudes to investment risk
- Behaviour in relation to investment choice
- Pension fund choices:
 - How do people choose?
 - What types of funds do they choose?
 - Do they switch between funds?
 - Do people make active investment choices or stay in a default fund?
- Pension savings adequacy.

The findings from each of these categories are outlined in the following sections.

2 Understanding of and attitudes to investment risk

Recent qualitative research from the UK found that most consumers had a basic understanding of the risk-reward relationship (i.e. higher risk meant potentially greater rewards; lower risk meant they stood to lose less but in turn the rewards would be less). Beyond this, however, understanding was limited. Most did not have a clear idea of what these risks actually were and many felt that long-term investments were riskier, mainly because they would not be able to access their money in the case of unexpected events (IFF Research, 2007).

There seems to be considerable confusion among UK consumers about the levels of risk associated with different investment products and fund types. Most consumers in a recent qualitative study believed (wrongly) that there was no capital at stake in low-risk investments (IFF Research, 2007). The Baseline Survey of Financial Capability indicates that some risk-averse consumers may take out investment products unaware that there is any financial risk involved (Atkinson et al., 2006).

Qualitative and quantitative research in the UK consistently shows that people's knowledge and understanding of pensions is generally poor (Clery et al., 2007; Summers et al., 2005; Loretto et al., 2001). Many participants in a recent qualitative study were unaware that pension funds were invested on the stock market, and instead tended to view them as long-term savings accounts (Bunt et al., 2006). A random survey of the British population found that pension plan participants were often ignorant of the basic structure of different types of retirement savings options and the risks associated with them. The survey found that almost half (43%) of respondents with an occupational pension scheme were not sure if they had a defined benefit (DB) or a defined contribution (DC) pension plan (Clark and Strauss, 2008).

2.1 Attitudes to risk

Quantitative and qualitative research carried out in the UK indicates that attitudes to investment risk depend on factors such as personality, circumstances, educational attainment, level of financial knowledge and experience, and extent of financial product portfolio (Conquest Research Limited, 2004; Distribution Technology, 2005). Quantitative research carried out in the US identifies a similar range of factors, including income, wealth, age, marital status, gender and level of education (Finke and Huston, 2003).

In general, it has been observed that women are more risk averse than men, the young are more risk seeking than the old, wealthier individuals manifest a greater willingness to invest in equities and the poor are risk averse (Clark and Strauss, 2008). One US survey (of faculty and staff working at a large university) found that a combination of education, financial knowledge, income and occupation explained the most between-group variability in risk tolerance. Even so, this model only explained about 22% of an individual's financial risk tolerance, suggesting that other factors

might differentiate levels of risk tolerance more effectively, such as attitudinal or psychological factors (Grable, 2000).

Attitudes to risk change over time as needs alter and people's capacity to afford to lose varies (Conquest Research Limited, 2004). The evidence indicates fairly clearly that willingness to take financial risk decreases significantly among people who are retired or nearing retirement (Distribution Technology, 2005; Finke and Huston, 2003). In addition, work carried out in the UK on the measurement of investors' risk appetite (which depends on their attitude to risk) suggests that it fluctuates within a relatively narrow gauge during 'normal' times, but falls sharply during crises (Gai and Vause, 2005).

On the whole, UK consumers have been found to be risk averse - particularly non-savers and those on low incomes (Atkinson et al., 2006; Hall et al., 2006; Distribution Technology, 2005; Conquest Research Limited, 2004). In relation to pensions, the majority of people in a recent UK national survey believed that a private pension scheme linked to the stock market was too much of a risk (Clery et al., 2007). Similar views were expressed by consumers in qualitative research; given the choice, many people would opt for a low-risk pension fund, despite the likely lower rate of return (Bunt et al., 2006). In another survey, respondents were asked to rate, on scale of 1 to 5, a range of potential features of a pension scheme that they would value. Four in ten (37 per cent) gave a high rating (4 or 5) to the concept of a guaranteed minimum level of pension (Summers et al., 2005).

In a recent nationally representative survey of the attitudes and likely behaviour in response to workplace pension schemes of individuals who would be eligible for the reforms, 44 per cent of respondents were classified as risk averse based on a standard measure of risk preference. About two in ten (17 per cent) were classified as being very mildly risk averse and 29 per cent were classified as risk loving (Webb et al, 2008).

Qualitative research conducted with people in the target group for automatic enrolment under the Government's workplace pension reforms found that most participants were unwilling to take risks with their money, even over the long-term (five years or more). The most common reasons cited for being averse to taking risk included the responsibility of raising a family and taking on large financial commitments such as a mortgage. Consequently, they were mainly interested in being able to choose lower-risk pension investment funds (Collard and Breuer, 2009).

2.1.1 Gender differences in attitudes to risk

Empirical research (most of it from the US in the form of large-scale surveys) demonstrates fairly consistently that women are more risk averse than men in their attitudes and behaviours towards investment decisions, including those that relate to pensions. A review of psychological studies suggests that this reflects a lower tolerance to risk among women generally, financial or otherwise (Byrnes, Miller and Schafer, 1999, cited in Watson and McNaughton, 2007).

A number of studies have variously controlled for age, education, income, wealth and marital status, and found a gender difference exists independently of the influence of these characteristics. For example, analysis of the US Survey of Consumer Finances

found that the proportions of wealth held in risky asset classes grew more steeply for men with increasing wealth (Jianakopulos and Bernasek, 1998). A small-scale survey of university academics in the US (Bernasek and Shwiff, 2001) also found that the lower levels of stocks in women's pension plans held true regardless of marital status (as well as financial decision-making responsibilities within couples).

Women have been found to be less likely than men to have a defined contribution (DC) pension plan (Sunden and Surette, 1998). Consistent with the finding that they tended to hold more conservative asset classes in their overall investment portfolios (Jianakopulos and Bernasek, 1998), women with DC pension plans in the US allocated a smaller proportion of their plan to stocks (Bernasek and Shwiff, 2001). In a study carried out in Australia, women chose more conservative investment plans for their superannuation schemes than men (Watson and McNaughton, 2007).

Some studies indicate that marital status and wealth play bigger roles than gender, in some cases supplanting the effects of gender. Analysis of the US Survey of Consumer Finances (Sunden and Surette, 1998) found that gender differences in DC pension fund allocations could only be understood in combination with marital status: other things being equal, single women and married men were less likely than single men to choose "mostly stocks" (a riskier portfolio) and married women were more likely than single women to choose this. The tendency for women to invest in less risky asset classes than men appeared to be attributable to differences in wealth, as measured by net worth and expectation of an inheritance (Embry and Fox, 1997). An Australian study concluded that, despite evidence of gender differences in risk preferences, lower income was the main contributor to lower projected retirement benefits among women (Watson and McNaughton, 2007).

Finally, the explanations for gender differences observed in research have been summarised with reference to gender inequalities in wealth and the different gender roles that impact on these inequalities (Bajtelsmit and Bernasek, 1996). The authors suggest that the explanations can be categorised in terms of outcomes (wealth, income and employment) and that these outcomes are caused by gender discrimination in labour and credit markets, investment advice and information on investment decision making, education, skills and training and responsibility for the care of dependents.

2.2 Summary of key points

- UK consumers have low levels of knowledge and understanding about pensions and investments. They also tend to be risk averse.
- Attitudes to risk depend on a wide variety of factors including age, income and wealth, gender, marital status, personality, educational attainment, and level of financial knowledge and experience.
- On the whole, women tend to be more risk averse than men. Some studies argue that factors such as marital status, wealth and income play a bigger role than gender in explaining differences in attitudes to risk
- Attitudes to risk change over time. In particular, willingness to take financial risk tends to decrease significantly among people at or near retirement. Research on measuring investors' appetite for risk suggests that it falls sharply during economic crises.

3 Behaviour in relation to investment choice

Much of the literature on investment choice behaviour comes from the field of behavioural economics. The evidence base for this literature comes largely from the US, much of it in relation to the behaviour of participants in 401(k) retirement savings plans.² Most of the evidence is drawn from survey data, and includes observations of actual behaviour as well as some observations from experimental studies.

Various authors have reviewed the behavioural economics literature relating to pension investment choice, including Gallery and Gallery (2005) and Clark and Strauss (2008). In addition, Tapia and Yermo (2007) carried out a review for the OECD of mandatory individual account pension systems, which share some of the characteristics of the proposed personal accounts scheme in the UK. We draw heavily on these earlier reviews in this section.

According to modern portfolio theory, rational investors should hold diversified portfolios that include the most efficient combinations of assets to optimise risk and return, and which reflect investor utility preferences and time horizons (Gallery and Gallery, 2005).³ Individuals do not always act according to economic theory, however, particularly under conditions of risk and uncertainty (Kahneman and Tversky, 1979, cited in Clark and Strauss 2008), a position supported by more recent empirical research.

The review carried out for the OECD summarises the range of obstacles and challenges identified by behavioural economists that compromise good investment decision making (Tapia and Yermo, 2007). It identifies six main factors that are widely accepted and frequently cited in the literature on investment choice: choice and information overload, unstable or undefined preferences, heuristic decision making (use of short-cuts and rules of thumb), framing effects and investment menu design, procrastination and inertia, and overconfidence. These factors are outlined below. We also consider a seventh factor that is implicit in some of the work cited by Tapia and Yermo (2007) – the apparent lack of consumer understanding and knowledge about pensions and investment choice.

3.1 Choice and information overload

As Tapia and Yermo (2007) note, there is considerable evidence (mainly from the US in relation to 401(k) retirement savings plans) that too many investment choices can cause information overload. This, in turn, may lead to declining rates of pension

² A 401(k) retirement savings plan is a type of defined contribution plan sponsored by employers. Employees choose a percentage of their salary to contribute to the plan, and employers may also make a contribution. . The employee's contributions are invested, and any earnings are tax-deferred until the employee draws the money out at retirement. . In participant-directed plans (the most common type of plan), the employee can select from a number of investment options.

³ In economics, utility is a measure of the relative satisfaction from consuming a good or service, in this case a pension or investment.

participation and a greater use of the default fund option. As we go on to discuss in section 4.1, pension plan participants in some countries have a vast range of investment fund choices. Use of the default fund option in pension schemes is discussed in detail in section 4.5.

3.2 Unstable or undefined preferences

The behavioural economics literature indicates that individuals often do not arrive at an investment decision with firm preferences. The most frequently cited work, carried out in the US, found that pension plan participants appeared to have relatively weak preferences for the portfolio they had selected themselves (Benartzi and Thaler, 2001). In this experimental study, participants were given the choice between the distribution of retirement outcomes implied by the actual asset allocation in their 401(k) plan and the distribution implied by the average allocation among all participants in the same plan. Most participants preferred the average distribution to that based on their own allocation. The authors characterised this as an example of an aversion to ‘extremeness’ because most participants had portfolios that were, almost by definition, more extreme than the average. Such results seem to call into question individuals’ ability to choose an optimal asset allocation (i.e. the most favourable allocation that would best meet their financial needs). As Tapia and Yermo (2007) note, this may be symptomatic of a deeper lack of knowledge and understanding of the choices offered.

A national survey carried out in the Netherlands seems to provide further evidence of unstable preferences in relation to asset allocation. When given the choice, the typical respondent opted for a conservative portfolio with stocks making up only 30 per cent of the average portfolio. However, there was a tendency for respondents to switch to a riskier portfolio when shown the distribution of long-run returns on their own portfolio and the mean risk portfolio, e.g. containing more stocks (Van Rooij et al., 2007a). The authors suggest that these findings indicate that many Dutch pension plan participants lack the necessary skills to be in charge of their own pension investment portfolio.

3.3 Heuristic decision making (rules of thumb)

Individuals may take mental short cuts to reach a decision, particularly when there is time pressure or when other factors (such as lack of understanding) make it difficult to assess the available choices (Kahneman and Tversky, 1979, cited in Tapia and Yermo 2007). There is a considerable body of work on the naïve diversification strategies that individuals use to make investment choices, again much of it emanating from research into 401(k) retirement savings plans in the US. These strategies are discussed in more detail in section 4.2.

3.4 Framing effects and investment menu design

Tapia and Yermo (2007) cite evidence from the US that the investment choices made by individuals in relation to 401(k) retirement savings plans are affected by the numbering and order of the investment options that are presented to them (see section 4.2 below). This is supported by experimental research carried out in the UK (Goodman, Undated), although this focused on investment decisions generally, rather than pensions. Tapia and Yermo (2007) also cite US research evidence that investors

may react differently depending on whether the long-term or short-term results are presented to them. Again, they suggest that this might be evidence of lack of consumer knowledge or ability to make such complex decisions.

3.5 Procrastination and inertia

Tapia and Yermo (2007) cite evidence (again mostly from the US in relation to 401(k) retirement savings plans) that individuals are affected by inertia or procrastination (i.e. they put off a decision until tomorrow) when faced with decisions about investment choice. This has been shown to result in sub-optimal choices (i.e. less favourable or desirable choices) that may not meet the individual's financial needs and a failure by pension plan participants to rebalance their portfolios. We discuss the strategies that people use to make investment choices in detail in section 4.2. Evidence about the types of funds that people chose is presented in section 4.3, and research findings about the frequency of switching between funds is discussed in section 4.4.

3.6 Overconfidence

A final factor reported by Tapia and Yermo (2007) is that individuals may be overconfident and overestimate their knowledge and abilities when making investment choices. The research they cite, however, seems mostly to relate to individual investors who make a proactive choice to trade. Its relevance to private pension schemes may therefore be limited, particularly as some of the other obstacles and challenges reported above are judged to be rooted in a lack of knowledge and understanding among individuals.

3.7 Consumer lack of understanding and knowledge

Additional evidence from the US and the UK supports the notion that individuals lack the knowledge and understanding to make pension investment choices.

Clark and Strauss (2008) cite evidence from the US that calls into question the ability of pension plan participants to make decisions that are consistent with their long-term financial needs, because of lack of financial knowledge and understanding. In a survey of US employers offering 401(k) plans, 80 per cent of employers reported that their employees were confused about 'where to invest/what funds to use' and 55 per cent reported that employees were confused about how much to save for retirement (Deloitte, 2008).

Qualitative research carried out in the UK indicates that (with some exceptions) consumers generally find choice in pension schemes confusing (Hall et al., 2006) and feel ill-equipped to make decisions about the sorts of funds they should invest in, without first seeking professional advice (Bunt et al., 2006). For some groups (low income and those without pension provision), even in the case of making a choice from a shortlist, reservations about making a provider choice persisted (Hall et al, 2006). A survey carried out in one UK company found that knowledge and interest in pensions and investment choice was low among members of its occupational pension scheme; scheme members who had received financial advice exhibited more interest and knowledge, however (Byrne, 2007).

Other qualitative research with UK workers eligible to join an employer pension scheme found that pension purchasing decisions were generally characterised by confusion and apathy, with decisions taken in a way that was neither completely rational or completely informed (Harrison et al., 2006).

3.8 Summary of key points

- The field of behavioural economics provides much of the literature on investment choice behaviour. The main body of evidence relates to the behaviour of participants in 401(k) retirement savings plans in the US.
- Six key factors have been identified that may hinder good investment decision making among individuals:
 - Choice and information overload
 - Unstable or poorly defined investment preferences
 - Heuristic decision making which involves the use of mental shortcuts or rules of thumb
 - The framing and presentation of investment choices to consumers
 - Procrastination and inertia
 - Overconfidence, although this seems to apply mainly to individual investors who make a proactive choice to trade.
- There is also evidence that consumers lack the understanding and knowledge to make pension investment choices themselves.

4 Pension fund choices

This section looks in detail at the evidence on pension fund choice: the number of investment fund options open to people, what strategies people use to make pension investment choices and the types of investment funds they choose. It also looks at the extent to which people switch investment funds within their pension scheme. The final section explores the evidence relating to whether people make an active investment choice or stay in a default scheme.

The majority of evidence comes from studies carried out in the US, usually involving analysis of survey data and administrative data. There is some additional material from the UK, Sweden, Australia and the Netherlands, again mainly comprising analysis of survey and administrative data, as well as official statistics and some qualitative data.

4.1 Number of investment fund options

In their review of mandatory individual account pension systems, Tapia and Yermo (2007) identify some countries (e.g. Chile, Hungary, Hong Kong) that offer pension plan participants a limited range of fund choices, typically no more than five, where the funds are differentiated mainly by the proportion invested in equities. In contrast, other countries (US, Sweden, Australia) offer relatively unlimited investment choices to plan participants. The most recent statistics for Sweden, for example, show that in 2007 there were 86 fund management companies with a total of 785 funds registered with the premium pension system (Premium Pension Authority, 2007).

A survey of US employers indicates that the average number of investment options offered by employers in their pension schemes increased from 14 to 17 in 2007 (including 'premixed' portfolios) (Hewitt Associates LLC, 2007). Administrative data from one large pension plan provider indicate that the average plan offered 23 investment options in 2007, up from 13 in 2000. They note that plan sponsors (i.e. employers) add fund options at a faster rate than participants use them. Nearly half of plans (47 per cent) offered between 11 and 20 options, but 56 per cent of participants used only one, two or three options (Vanguard, 2008).

Iyengar and Lepper (2000) found that, while people generally value choice, they can easily be overwhelmed by it. They suggest that choice overload may be exacerbated in contexts (such as decisions about major stock purchases) where the costs associated with making the 'wrong choice' or even the belief that there are truly 'wrong' choices are much more worrying to an individual (cited in Singh et al., 2005).

Rather than promote consumer choice and active decision making, increased fund choice has been shown to depress the probability of employee participation in 401(k) retirement savings plans. Analysis of administrative data from 401(k) plans indicates that, other things being equal, every ten funds added was associated with a 1.5 to 2 per cent drop in participation rates (Sethi-Iyengar et al., 2004). The same analysis

found that the majority of 401(k) plans offered between 10 and 30 options, but that plans offering fewer options had significantly higher employee participation rates. Similarly, an experimental study undertaken in the US found that fewer investment choices resulted in less information overload, but only among individuals with above average financial knowledge, as assessed by a financial literacy test (Agnew and Szykman, 2004). There is also evidence that the number of investment options offered to pension plan participants can impact on asset allocation; this is discussed in detail in section 4.3.

In recent qualitative research conducted with people in the target group for automatic enrolment under the UK Government's workplace pension reforms, most participants suggested that between three and five investment funds would be a manageable number to choose from. They also felt strongly that funds should be clearly differentiated in terms of risk, in order to help people choose between them (Collard and Breuer, 2009).

4.2 How do people make investment choices?

As outlined in section 3.3, evidence from the field of behavioural economics (largely based on research carried out in the US) indicates that individuals use what are called naïve diversification strategies in order to make complex decisions like investment fund choice. Examples of these strategies include individuals dividing their pension contribution equally among the number of funds offered by a plan (known as 1/n); relying on recent past performance when choosing funds, or favouring company stock (Benartzi and Thaler 2001; Huberman and Jiang 2006, cited in Tapia and Yermo 2007).

In keeping with this, qualitative research in the UK that explored investment decisions generally (not specifically pensions) found that level of risk, charges and fund size were mainly only considered by respondents who were more financially sophisticated. Among those with lower financial sophistication, investment performance was generally only considered in consultation with an adviser, and even then comprehension remained poor (Conquest Research Limited, 2004). UK survey evidence (which used gambling scenarios to assess people's attitude to risk) suggests that consumers more often focus on avoiding losses than on maximising possible gains (Distribution Technology, 2005). US research cited by Byrne (2007) found that investors with DC pension plans tended to seek to avoid short-term losses, despite the long time horizon usually involved in planning for retirement, a phenomena known as myopic loss aversion.

Several studies have shown that framing effects and investment menu design have a significant effect on individuals' investment decisions, which may result in sub-optimal investment choices that are unlikely to meet the individual's financial needs in retirement.⁴ Notably, there is a positive relationship between the proportion of equity funds offered by a pension plan and the proportion of overall plan portfolios invested in equities (Choi et al., 2004). Analysis of US 401(k) administrative data shows that this holds true for other asset classes as well (Brown et al., 2007). Consequently, it appears to be possible to influence the portfolio allocation of

⁴ This is referred to by some authors as prospect relativity: the dependence of human preferences on the set of options they are presented with (Vlaev et al, 2007).

participants by altering the mix of equity and bond funds that are offered, even if the overall investment fund offering remains the same (ibid).

The same conclusion has been reached in the UK, based on evidence from experimental studies. One study concluded that people choosing from a range of investment options tended to select the middle option whether the overall range is low or high in value (Goodman, undated). Another study found that various measures of risk aversion (in the form of questions about the amount of risk that respondents were prepared to take, how concerned they were about their financial future and whether or not they would take a gamble to increase their earned income) did not account for the amount of risk taken by respondents in each experimental condition (Vlaev et al., 2007).⁵ According to the authors, these findings support the notion that individuals' decisions can be influenced by manipulating the range of choice options.

Evidence from the US has found that workplace-based financial education for 401(k) plan participants resulted in increased participation and greater portfolio diversification, particularly for employees hired under automatic enrolment, but the magnitude of change was not great (Madrian and Shea, 2001). Another US study which examined data for employees at a large university found that peer effects among employees may be an important determinant of savings decisions in 401(k) pension plans (Duflo and Saez, 2002).

4.2.1 Use of advice in pension purchase

Recent UK survey data indicates that around 50 per cent of private pension purchasers received advice pre-purchase, where an adviser either recommended a product or recommended a product and went on to arrange a sale (Finney and Kempson, 2008 forthcoming).⁶ The quality of financial advice that consumers receive has, however, been called into question by a number of research studies.

UK consumer research (both qualitative and quantitative) has highlighted disparities between consumer and adviser definitions of 'low risk' (Conquest Research Limited, 2004) and the risk involved in different investment products (Diacon, 2002). Mystery shopping among 50 firms offering financial advice found that just over a quarter of firms established customers' attitudes to risk ambiguously, and a few did not establish it at all (Financial Services Authority, 2006).

In Australia, shadow shopping in relation to superannuation schemes highlighted that in some cases advice was not appropriate for the customers' needs in some way, or the adviser had not made sufficient enquiries to assess appropriateness. Where advice was provided on switching investment funds, in about a third of cases it was assessed that there was clearly or probably not a reasonable basis for the advice. The main problems involved advice to switch to higher-fee funds with no countervailing benefits or the loss of important insurance cover through fund switching (Australian Securities and Investments Commission, 2006).

⁵ The base for this study was low, comprising 64 respondents (representing a response rate of 10%).

⁶ The base for pension purchasers was small, however (n 57).

4.3 What types of pension funds do people choose?

Based on analysis of US pension plan participants in their 50s and 60s, it has been estimated that participants who are given investment choice are more likely to invest in stocks (and also to contribute to their plan and to have larger sums of money saved in their plan) than comparable participants without investment choice (Papke, 2003). A review of research on 401(k) plan designs supports this assertion (Choi et al., 2004). Tapia and Yermo (2007) conclude from their review of mandatory individual account pension schemes that, in general terms, international evidence appears to reveal a preference among plan members towards equity funds. They note, however, that this may be due to factors such as heuristic biases, framing effects and the professional advice that members receive.

Other research (primarily from the US) suggests a rather more complex picture in terms of individuals' pension fund choices. As mentioned above, there is evidence that choice overload can impact on asset allocation. A review of evidence found that an increase in the number of investment funds available to choose from was correlated with a shift from equities towards lower-risk asset classes (Choi et al., 2004). Other US research cited in Tapia and Yermo (2007) supports this (Sethi-Iyengar and Kamenica, 2006).

Administrative data from a large US 401(k) plan provider shows that, while just over 70 per cent of plan assets and participant contributions were invested in equities, the allocation to equities varied significantly between participants. At one extreme, 11 per cent of participants had no allocation to equities at year-end 2007, while 17 per cent had their entire plan account invested in equities. Half of participants held more than 80 per cent of the portfolios in equities (Vanguard, 2008). The authors state that while some participants may be making these equity allocations on the basis of their objectives, time horizon, risk tolerance or other personal factors, it is possible that others may have taken on low- or high-risk positions naively, perhaps because of a lack of investment knowledge or a tendency to chase market returns (ibid).

In the UK, there is evidence from consumer surveys of a strong preference for property as a long-term investment.⁷ In one general population survey, two-thirds of respondents believed that property was the best long-term investment, compared to nine per cent who chose equities (the second most popular option). Even so, less than half of respondents thought they would actually use property to pay for retirement (Association of British Insurers, 2007). In another survey, of occupational pension plan members at one company, respondents were asked the extent to which they thought different asset classes were appropriate for saving for their retirement. Investment in property attracted the highest scores (83 per cent for own home, 77 per cent for other property investments), surpassing UK equity funds and gilts by some way (52 per cent for UK equity funds, 50 per cent for UK gilts) (Byrne, 2007).

Recent qualitative research conducted with people in the target group for automatic enrolment under the UK Government's workplace pension reforms explored investment fund choice preferences using a range of potential options. On the whole, participants mainly expressed interest in investing in lower-risk pension funds (Collard and Breuer, 2009).

⁷ NB these studies were conducted before the dip in the property market during 2008

Finally, some studies have found ‘home bias’ in asset allocation, where pension plan participants favour investing in the stock of the company they work for or industries based in their own country (see for example: Choi et al., 2004; Palme et al., 2007; Gerrans et al., 2006).

4.3.1 Asset allocation and personal characteristics

A number of studies have explored the relationship between asset allocation and personal characteristics. As we might expect, these findings broadly mirror the evidence on attitudes to risk. Analysis of 401(k) administrative data from 1994-1998 found that equity allocations were higher among higher earners, married participants, and those with more job seniority (Agnew et al., 2000). Similar findings are reported from a large-scale survey in Sweden, with a positive relationship between income and level of risk and evidence that married pension participants seem to pool risk (Palme et al., 2007). In a UK study that applied an experimental economics methodology with low-to-middle income workers, risk-averse participants chose safer funds, as did female participants (Hey, 2008).⁸ Although not specifically focused on pensions, a Dutch household survey found that respondents with low financial literacy were significantly less likely to invest in equities (Van Rooij et al., 2007b).

While there is evidence of a positive link between income and asset allocation, two studies note that the differences are not altogether clear cut. In keeping with other studies, recent analysis of 401(k) administrative data found that higher-income participants took on rather more equity risk than those on lower incomes. The differences in equity exposure by income were not great, however – on average 68 per cent for those with household incomes of less than \$30,000, compared to 76 per cent for participants with household incomes of more than \$100,000 (Vanguard, 2008).

In addition, survey evidence from Sweden shows that participants at the bottom of the income distribution took on as much risk as those at the top, suggesting that low-income participants were not diversifying their overall portfolio (Palme et al., 2007). The same study found that variability in income and the risk of exiting the labour market through disability, unemployment, or sickness did not appear to affect the investment decision (ibid). One explanation offered by the authors is that participants on low incomes who expect to receive the means-tested guaranteed pension benefit have little to lose by taking on additional risk in their pension investments, because the level of guaranteed benefit provides a minimum secure income (ibid).

In a similar vein, there is evidence from the US Survey of Consumer Finances that participants who have a defined benefit (DB) pension plan underlying their DC plan are more likely to invest in equities than those whose primary pension provision is a DC plan. In other words, it appears that employees with a guaranteed source of retirement income are likely to invest other retirement assets more aggressively (Uccello, 2000). A survey of US college and university employees also identified

⁸ Hey (2008:1) describes experimental economics as follows: ‘The methodology of experimental economics involves the replication, in either a laboratory situation or in the field, of a well-defined economics problem, with participants involved in tackling the economic problem with appropriate incentives. A crucial element of the methodology is control over the conditions of the experiment, so that particular factors of interest can be investigated without confounding effects of extraneous factors.’

other retirement plan participation as one of the primary drivers of risky investment behaviour (Dulebohn, 2002).

Finally, evidence from the US (in the form of administrative data) highlights age as one of the key factors in determining investment decisions. As a result, plan participants aged between 25 and 54 were found to have the highest equity exposure (approximately 80 per cent of plan assets), while equity allocations were lowest for participants older than 65, many of whom were retired or would soon do so (Vanguard, 2008). Notably, the same data indicates little difference between men and women in equity allocation (ibid).

4.4 Do people switch investment funds?

The available evidence shows a general trend of low levels of investment fund switching by pension plan participants. In a US study, Ameriks and Zeldes (2001) observed that, over a ten-year period, half (47 per cent) of their sample of pension plan participants made no changes to the asset allocation of new contributions, and 73 per cent made no changes to the existing asset allocation in their accounts (cited in Gallery and Gallery, 2005).

The most recent data from a large 401(k) pension plan provider in the US shows that 15 per cent of participants made one or more trade during 2007 (Vanguard, 2008). The authors also cite recent analysis of trading in DC plans over a two-year period, which indicated that 80 per cent of active participants had no trading in their DC plan accounts.⁹ Another 11 per cent of active participants made only one trade during the two-year period. Only two per cent of participants were active traders, making six or more trades during the two-year period. Active traders were more likely to be older, higher income males with longer plan tenure (ibid). A US web-based survey of employees further supports the notion that plan participants tend to make a decision and then stick with it. It found that only 17 per cent of employees made any changes to their 401(k) planning as a result of the online investment advice offered to them. Around four in ten (37 per cent) did not even log on to access the advice (Lucas, 2002).

The statistics for investment fund switching in Sweden's mandatory individual account pension scheme are remarkably similar to the US, so that in 2007 14 per cent of plan members switched funds on at least one occasion (Premium Pension Authority, 2007).

In a UK survey of occupational pension plan members, two-thirds of respondents said they reviewed the investments in their pension plan at least every three years, with 48 per cent doing so annually. The remaining third reviewed their choices less than once every five years or not at all. Those who did review their choices regularly made few changes as a result: 36 per cent made changes less than once every five years, and a further 43 per cent never made any changes. Members who had had advice were significantly more likely to review and change their investments on a regular basis (Byrne, 2007).

⁹ Active participants were defined as participants continuously in their DC plan for two years with at least one account contribution during the two-year period.

4.5 Do people make active investment choices or stay in a default fund?

In their review of mandatory individual account pension schemes, Tapia and Yermo (2007) note that there is considerable variation in levels of active decision making across the countries operating these schemes. They find that, on the whole, international evidence supports the notion that a large number of investment options can cause information overload, resulting in confusion among scheme participants and greater use of default funds.

In particular, there are much higher levels of active choice among scheme members in Central and Eastern European (CEE) countries and Hong Kong, where fewer investment choices are offered. For example, at least 85 per cent of scheme members in CEE countries have made an active choice. There are exceptions to this, such as Peru, where less than one per cent of scheme participants have made an active choice between the three possible investment options. This is attributed to the design, low cost and good performance of the scheme's default fund (ibid).

In contrast, other countries that offer a wide choice of pension investment funds (the US, Sweden and Australia) have far lower levels of active choice, and correspondingly higher proportions of people enrolled in the default options.

Analysis of administrative data from three large US firms that automatically enrol new employees into 401(k) plans indicates that the majority of new participants (between 65 and 87 per cent) saved at least temporarily in the default fund and at the default contribution rate (Choi et al., 2001a). This reduced to around half of new plan participants after two years of scheme tenure (between 40 per cent and 54 per cent) and three years of scheme tenure (45 per cent) (ibid). On the basis of these findings, the authors raise concerns that the low default contribution rate combined with the conservative default investment funds may result in sub-optimal (or less desirable) outcomes for plan participants. One large 401(k) plan provider reports that participants younger than 25 are more than twice as likely to use the default option compared with other participants (Vanguard, 2008). Use of the default option has also been linked to low financial knowledge in an experimental study carried out in the US (Agnew and Szykman, 2004).

In terms of the trend in the percentage of active pension savers in Sweden, by the end of 2007 almost six in ten (58 per cent) pension savers in the Premium Pension Scheme overall had made an active choice and their share of total pension assets amounted to 72 per cent (Premium Pension Authority, 2007). This trend masks a sharp decline over time in the percentage of pension savers making an active choice in the scheme, however. In 2000, when the scheme was first launched, 67 per cent of savers made an active choice. In 2007, this was 1.6 per cent, down from 7.4 per cent in 2006, largely attributed to a change in the scheme's communication strategy. Consequently, new savers were no longer automatically sent a 'selection package' with detailed information about the scheme (including a fund selection form, a guide to fund selection and a fund directory) but instead directed to where they could obtain this information. The change in strategy was based on the low percentage of members making an active choice (ibid).

The high level of participation in 2000 is attributed mainly to the fact that large numbers of the adult population were involved, and the assets invested consisted of accumulated pension entitlements for 1995-1999. There was also a major publicity campaign run by the scheme and mass media interest was high. In contrast, between 2002 and 2007 most new pension savers were young people with small sums to invest (ibid). It is notable that during the period 2001-2005, the Swedish default fund performed better than an average of all funds that could be actively chosen, and was considerably cheaper (Tapia and Yermo, 2007).

Survey data on the Australian superannuation scheme shows that four per cent of respondents had chosen a new fund as a conscious act of choice (rather than moving because of a change of job or similar) during the first three months of new legislation on the choice of fund (Clare, 2006).¹⁰ A similar proportion (four or five per cent) said they were likely to change funds in the next 12 months (ibid).

UK research cited in Byrne (2007) reports that about 80 per cent of members of group personal pension plans in the UK tended to prefer the default option. In the author's own survey of occupational pension scheme members, however, around half (52 per cent) of respondents said they had accepted the plan default option (out of three possible options), while 48 per cent said they had made an active choice. The author goes on to report that almost 80 per cent of plan assets were in the default 'Balanced' fund, which means that many of those who had exercised active choice still decided this was the most appropriate fund for them. As this was the middle of three fund options, it may also be an illustration of 'extremeness aversion' among the plan members (ibid).¹¹

In qualitative research conducted with people in the target group for automatic enrolment under the UK Government's workplace pension reforms, most participants felt they would personally want to make an active investment choice if they were automatically enrolled into a scheme.¹² This was largely driven by a desire to have personal control over the level of investment risk, which generally meant ensuring that it was low risk. Participants considered that the provision of information was crucial to enabling active investment choice, and this included clear explanations of the different levels of risk associated with investment funds. There is evidence to suggest, however, that information provision in itself is not enough to drive action (Collard and Breuer, 2009).

4.6 Summary of key points

- The extent of investment fund choice varies widely across the mandatory individual account pension schemes that operate worldwide. The greatest choice is seen in the US, Sweden and Australia.

¹⁰ Since 1 July 2005, the majority of Australian employees who receive superannuation contributions from their employers have been able to choose their superannuation fund.

¹¹ Byrne also notes that the survey respondent group had biases relative to the plan membership, which reinforced existing biases in the membership of the pension scheme relative to the general population, namely mainly male, older, higher earners.

¹² Though previous research indicates that people tend to be overly optimistic about taking action

- US evidence indicates that increased investment fund choice reduces rather than increases the likelihood of participation in retirement savings plans, which supports the notion of choice and information overload.
- In qualitative research in the UK with the target group for automatic enrolment, participants considered that between three and five investment funds was a manageable number to choose from.
- Faced with complex decisions like investment choices, individuals use what are called naïve diversification strategies such as dividing their pension contribution equally among the number of funds offered by a scheme. Their choices are also influenced by the way in which investment fund choices are presented (known as framing effects).
- On the whole, individuals tend to focus more on minimising losses than maximising gains, even with long-term investments such as pensions.
- Overall, members of mandatory individual account pension schemes display a general preference for equities. This may partly be down to factors such as using mental shortcuts, how choices are framed and the advice that individuals receive.
- Evidence from US retirement savings plans shows that equity holding is polarised between those with all their pension savings invested in equities and those with nothing in equities. In addition, an increased number of investment fund choices is associated with a shift away from equities into lower-risk assets.
- UK qualitative research with the target group for automatic enrolment found that participants were mainly interested in the idea of investing in lower-risk rather than higher-risk pension funds.
- There is a positive link between income and asset allocation, but the differences in equity exposure by income are not great, suggesting that some lower-income individuals may be over-exposed to equities.
- There is evidence of very low levels of switching between investment funds by pension scheme members, suggesting that individuals tend to stick with their original choice.
- On the whole, international evidence supports the notion that a large number of investment options can cause information overload, resulting in confusion among scheme participants and greater use of default funds. As a result schemes that offer greater investment choice see lower levels of active decision making while those that offer a more limited choice generally see higher levels of active decision making. Factors such as advertising and information provision can have a considerable impact in terms of promoting active decision making.
- There is evidence to suggest that the availability of low-cost default funds that perform well can also result in lower levels of active investment choice.
- Qualitative research in the UK around proposed pension reforms found that most participants would personally want to make an active investment choice if they were automatically enrolled into a workplace pension scheme.¹³ This was largely driven by a desire to have personal control over the level of investment risk. Adequate information was considered crucial if individuals were to make an investment choice, including clear explanations of the different levels of risk associated with investment funds.

¹³ Though previous research indicates that people tend to be overly optimistic about taking action

5 Pension savings adequacy

Survey data from the US and the UK consistently show that many adults are either not confident that they have adequate savings for retirement or have no idea whether or not their savings will provide an adequate income in retirement.

A survey at one large US corporation found that two-thirds of employees believed they were saving too little for retirement and this was confirmed by administrative data which indicated they had comparatively low savings rates (Choi et al., 2001b).

Analysis of 1998 administrative data for employees at seven US firms indicated that among people aged 59.5 years and over, between 20 and 60 per cent made pension contributions below the threshold at which they became eligible for employer contributions, thereby foregoing a significant financial benefit. This was despite the fact that members could cash in any or all of the matched personal contribution immediately and without penalty (enabling them to retain wealth inside the plan and increase wealth outside the plan). Providing employees with information about the benefits they were losing out on did not raise contribution rates. There was evidence of lower levels of financial literacy among members contributing below the employer contribution threshold than those contributing at or above this threshold, as well as procrastination. The authors assert that the findings present cause for pessimism about the role of financial incentives in increasing retirement savings contributions (Choi et al., 2007).¹⁴

In a national consumer survey, 25 per cent of UK working adults were not at all confident and a further 33 per cent were not very confident that they would have sufficient income to live comfortably in retirement. A further 10 per cent did not know (Association of British Insurers, 2007). Similarly, in another UK survey about half of respondents yet to retire had no idea what their income in retirement would be; this figure was much lower among those approaching retirement (Clery et al., 2007).

UK survey data provides estimates of the size and adequacy of people's actual pension pots. In a UK national consumer survey, 62 per cent of respondents had a pension pot worth less than £40,000.¹⁵ According to comparative tables produced by the FSA, a pension pot this size would generate a gross monthly income of £250 (£58 per week).¹⁶ Looked at another way, for a full-time employee on median earnings, a pension pot of £40,000 would generate a retirement income of 13 per cent of their pre-retirement income (this would be supplemented by state pension entitlement). Most respondents felt they needed 51 per cent or more of their current income to achieve a comfortable retirement but only 36 per cent believed they were on course to achieve this (Association of British Insurers, 2007).

¹⁴ There is an extensive body of research on the effectiveness of financial incentives and financial advice in encouraging pension saving, which was outside the remit of this review.

¹⁵ This includes a personal or employed DC pension plan.

¹⁶ The report notes that this is based on a single male non-smoker aged 65 who purchases a level annuity with no guarantee and excludes any tax-free lump sum taken out at the point of annuitisation.

The English Longitudinal Study of Ageing, which surveys individuals in households aged between 50 and State Pension Age, shows that the median value of those currently in a DC pension scheme was just £16,250. The mean value was around £35,500, indicating a skewed distribution with some very large values (Banks et al., 2005). On average, those with a private pension (either currently or in the past) had greater pension wealth than those who never had a private pension.¹⁷ Another survey of UK adults aged 18 to 69 similarly found that those with a private pension were more likely to have other resources that could help fund their retirement (namely a valuable house and significant liquid assets) than those without a private pension. They were also rather more likely to expect to inherit a substantial sum of money (Clery et al., 2007). In contrast, around three in ten respondents had no private pension and none of the other options to fund their retirement (ibid).

5.1 Summary of key points

- Many adults are not confident that they are saving enough for their retirement and these concerns are borne out by analysis of actual pension savings adequacy.
- On the whole, individuals with a private pension are likely to have greater levels of pension wealth or other financial resources to fund their retirement than those who do not.

¹⁷ A private pension refers to any non-state pension, including personal pension, stakeholder or employer pensions.

6 Conclusions

The review highlights that consumers generally lack any detailed knowledge or understanding of pensions and investments, even though they are increasingly expected to make their own financial provision for retirement. They also tend to be risk averse (women in particular), and seek to minimise losses rather than maximise gains, even in relation to long-term investments such as a pension.

When faced with complex decisions such as pension fund investment choice, there is strong evidence that individuals do not behave according to economic theory. Instead they use a range of strategies and are influenced in a number of ways that may result in decisions that are less than optimal in terms of providing them with an adequate income in retirement. (These are explored in more detail below.) Indeed, many individuals are not confident that they are saving enough for their retirement and these concerns are borne out by analysis of actual pension savings adequacy.

Evidence from the US suggests that information provision and financial education has a limited impact on individual behaviour in relation to making pension fund investment choices and switching funds. In Sweden, however, the communications strategy adopted by the mandatory pension scheme seems to have had a significant impact on levels of active decision making. While many people may rely on professional financial advice to make pension purchase and investment decisions, research evidence from the UK and Australia has highlighted concerns about the quality of advice provided to individuals (e.g. from financial advisers).

The remainder of this section draws out the key messages from this review for the Personal Accounts Delivery Authority, with reference to the specific questions set out in the research specification.

6.1 Do people make investment decisions that are too conservative to meet their intended objectives?

The research evidence indicates a widespread lack of knowledge and understanding about pensions and investment choice. Coupled with this, UK consumers (and women in particular) are generally found to be risk averse (section 2). In keeping with this, consumers have been found to focus more on minimising financial losses than maximising financial gains, even when making decisions about long-term investments such as a pension (section 4.2).

Faced with investment choices, there is evidence that people use ‘naïve diversification strategies’ (e.g. they may divide their pension contribution equally among the number of funds offered by a plan), which may result in sub-optimal decisions. Individuals’ investment decisions are also strongly influenced by the number and mix of investment choices that are offered (known as framing effects), highlighting the importance of pension plan design in achieving desired outcomes (section 4.2).

Giving people choice appears to encourage investment in equity funds and international evidence from mandatory individual account pension schemes reveals a general preference among participants for equity funds. This may result from factors such as framing effects, the use of ‘rules of thumb’ by consumers to make investment decisions or the professional advice that consumers receive. There is evidence from the US that allocation to equities is polarised between those participants who have no allocation to equities and those who have invested entirely in equities. Moreover, allocation to equities has been shown to decrease with the number of investment options offered (section 4.3).

Recent qualitative research conducted with people in the target group for automatic enrolment under the UK Government’s workplace pension reforms indicated that participants were mainly interested in investing in lower-risk pension funds (section 4.3).

While there is evidence of a positive link between income and equity asset allocation in pension plans (with higher equity allocations among higher earners), studies in the US and Sweden indicate that the differences are not great. This suggests that some participants on lower incomes may have poorly diversified portfolios and be over-exposed to risk. One explanation might be that these participants expect to have other resources in retirement, such as a state guaranteed minimum income, and so have little to lose by taking risks. Similar behaviour has been seen among people who have a defined benefit pension plan as well as a defined contribution plan (section 4.3.1).

6.2 What is the likelihood of pension scheme members switching investment funds over time? Is there any evidence that people switching between pension funds do not make sensible investment choices, given their personal and household circumstances?

The evidence shows a general trend of low levels of investment fund switching by pension plan participants. Evidence from the US and Sweden indicates that fewer than two in ten pension plan members switched funds on at least one occasion in 2007. There is some evidence to suggest that providing information does little to encourage fund switching or rebalancing (section 4.4).

There seems to be very little data about whether or not people make sensible choices when switching funds. One study in Australia highlighted problems with the advice provided to superannuation scheme members around fund switching, which involved advice to switch to higher fee funds with no countervailing benefits or the loss of important insurance cover (section 4.2.1).

6.3 In the context of the personal accounts scheme, what is the evidence around individuals’ likelihood of making an active investment choice rather than staying in the default fund?

There is considerable variation in levels of active decision making between countries that operate mandatory individual account pension schemes. On the whole, international evidence seems to support the notion that a large number of investment options can cause information overload, resulting in confusion among scheme participants and greater use of default funds. As a result, countries (such as Central and East European countries and Hong Kong) that offer limited investment choice

seem to have much higher levels of people making an active choice (over 80 per cent in some countries). In contrast, countries offering a wide choice of pension investment funds (US, Sweden, Australia) tend to have lower levels of people making active choices and correspondingly higher proportions of people enrolled in the default options (section 4.5).

One study in the US found that between 65 and 87 per cent of new participants saved at least temporarily in the default fund and at the default contribution rate, and a significant proportion (45 per cent) continued to do so three years later. The generally conservative nature of default investment funds combined with low default contribution rates has raised concerns about the possible sub-optimal outcome for these plan members (section 4.5).

In Sweden, overall figures show that 58 per cent of pension savers have made an active choice, but this masks a rapid decline in the proportion doing so over time, from 67 per cent when the scheme was introduced in 2000, to 1.6 per cent in 2007. It is notable that during the period 2001-2005, the Swedish default fund performed better than an average of all funds that could be actively chosen, and was considerably cheaper. The continued decline in active decision making between 2006 and 2007 is partly attributed to a change in the communications strategy, whereby scheme members no longer automatically receive information about their investment fund options (section 4.5).

Evidence from Peru also suggests that default funds that have low charges and perform well can result in low levels of active investment choice (section 4.5).

In qualitative research in the UK around proposed pension reforms, most participants said they would personally want to make an active investment choice if they were automatically enrolled into a workplace pension scheme.¹⁸ This was largely driven by a desire to have personal control over the level of investment risk. Adequate information was considered crucial if individuals were to make an investment choice, including clear explanations of the different levels of risk associated with investment funds (section 4.5).

¹⁸ Though previous research indicates that people tend to be overly optimistic about taking action

7 References

- Agnew, J., Balduzzi, P. and Sunden, A. E. (2000) Portfolio choice, trading and returns in a large 401(k) plan, *Center for Retirement Research Working Paper 2000-06*.
- Agnew, J. and Szykman, L. (2004) Asset allocation and information overload: the influence of information display, asset choice and investor experience, *Center for Retirement Research Working Paper 2004-15*.
- Association of British Insurers (2007) Retirement savings in the UK: The State of the Nation's Savings 2007/2008 (ABI Insurance Market Study No 4).
- Atkinson, A., McKay, S., Kempson, E. and Collard, S. (2006) Levels of financial capability in the UK: Results of a baseline survey (FSA Consumer Research Report 47), Financial Services Authority.
- Australian Securities and Investments Commission (2006) Shadow shopping survey on superannuation advice.
- Bajtelsmit, V. L. and Bernasek, A. (1996) Why do women invest differently than men?, *Financial Counselling and Planning*, **7**.
- Banks, J., Emmerson, C. and Oldfield, Z. (2005) Preparing for retirement: The pension arrangements and retirement expectations of those approaching State Pension Age in England, *Institute for Fiscal Studies Working Paper WP05/13*.
- Benartzi, S. and Thaler, R. (2001) How much is investor autonomy worth?, *University of California-Los Angeles Working Paper*.
- Bernasek, A. and Shwiff, S. (2001) Gender, risk and retirement, *Journal of Economic Issues*, **35**.
- Brown, J., Liang, N. and Weisbenner, S. (2007) Individual account investment options and portfolio choice: Behavioral lessons from 401(k) plans, *Journal of Public Economics*, **91**, 1992-2013.
- Bunt, K., Adams, L., Koroglu, Z. and O'Donnell, E. (2006) Pensions and pension reform (DWP Research Report 357).
- Byrne, A. (2007) Employee saving and investment decisions in defined contribution pension plans: survey evidence from the UK, *Financial Services Review*, **16**, 19-40.
- Choi, J. J., Laibson, D., Madrian, B. and Metrick, A. (2001a) For better or for worse: default effects and 401(k) savings behaviour, *NBER Working Paper No. W8655*.
- Choi, J. J., Laibson, D. and Madrian, B. C. (2004) Plan design and 401(k) savings outcomes, *NBER Working Paper 2004-4*.
- Choi, J. J., Laibson, D. and Madrian, B. C. (2007) \$100 Bill on the sidewalk; suboptimal investment in 401(k) plans, *Yale ICF Working Paper*
- Choi, J. J., Laibson, D., Madrian, B. C. and Metrick, A. (2001b) Defined contribution pensions: Plan rules, participants decisions and the path of least resistance, *NBER Working Paper No. W8655*.
- Clare, R. (2006) The introduction of choice of superannuation fund: results to date, Association of Superannuation Funds of Australia Research Centre.

- Clark, G. and Strauss, K. (2008) Individual pension-related risk propensities: the effects of socio-demographic characteristics and a spousal pension entitlement on risk attitudes, *Ageing and society*, **28**, 847-874.
- Clery, E., McKay, S., Phillips, M. and Robinson, C. (2007) Attitudes to pensions: The 2006 survey (DWP Research Report 434).
- Collard, S. and Breuer, Z. (2009) Attitudes towards investment choice and risk within the personal accounts scheme: Report of a qualitative study, (I DWP Research Report No. 565).
- Conquest Research Limited (2004) Consumer understanding of financial risk (FSA Consumer Research Report 33).
- Deloitte (2008) 401(k) Benchmarking Survey: 2008 Edition, Deloitte Consulting LLP.
- Diacon, S. (2002) Investment risk: A comparative study of the perceptions of consumers and advisers, *Centre for Risk and Insurance Studies Discussion paper series*, **2002.XI**.
- Distribution Technology (2005) Benchmarking UK consumer attitudes to risk, *News release dated 27/06/05*.
- Duflo, E. and Saez, E. (2002) Participation and investment decisions in a retirement plan: the influence of colleagues' choices, *Journal of Public Economics* **85** 121-148.
- Dulebohn, J. (2002) An investigation of the determinants of investment risk behaviour in employer-sponsored retirement plans, *Journal of Management*, **28**, 3-26.
- Embry, L. L. and Fox, J. J. (1997) Gender differences in the investment decision-making process, *Financial Counselling and Planning*, **8**, 33-40.
- Financial Services Authority (2006) Quality of advice process in firms offering financial advice: findings of mystery shopping research (FSA Consumer Research Report 52).
- Finke, M. and Huston, S. (2003) The brighter side of financial risk: Financial risk and tolerance and wealth, *Journal of Family and Economic Issues*, **24**.
- Finney, A. and Kempson, E. (2008 forthcoming) Consumer Purchasing Survey, *Consumer Research*.
- Gai, P. and Vause, N. (2005) Measuring investors' risk appetite, *Bank of England Working Paper 283*.
- Gallery, G. and Gallery, N. (2005) Paradox of choice in a mandatory pension savings system: challenges for Australian income policy, *Policy and Politics*, **33**, 519-532.
- Goodman, A. (Undated) Consumer understanding of risk, The Actuarial Profession.
- Grable, J. (2000) Financial risk tolerance and additional factors that affect risk taking in everyday money matters, *Journal of Business and Psychology*, **14**.
- Hall, S., Pettigrew, N. and Harvey, P. (2006) Public attitudes to personal accounts: report of a qualitative study (DWP Research Report 370).
- Harrison, T., Waite, K. and White, P. (2006) Analysis by paralysis: the pension purchase decision process, *International Journal of Bank Marketing*, **24**.
- Hewitt Associates LLC (2007) Trends and experience in 401(k) plans: 2007, Hewitt Associates LLC.
- Hey, J. D. (2008) Exploring the experimental economics approach in pensions (DWP Working Paper 43).
- IFF Research (2007) Investment risk rating: Consumer attitudes towards risk, Financial Services Consumer Panel.

- Jianakopulos, N. A. and Bernasek, A. (1998) Are women more risk-averse?, *Economic Enquiry*, **36**, 620-630.
- Loretto, W., White, P. and Duncan, C. (2001) Thatcher's children, pensions and retirement: some survey evidence, *Personnel Review*, **30**.
- Lucas, L. (2002) Meeting the financial planning needs of a diverse and paradoxical 401(k) population, *Benefits Quarterly*, **Fourth Quarter**.
- Madrian, B. C. and Shea, D. F. (2001) Preaching to the converted and converting those taught: Financial education in the workplace, *University of Chicago Working Paper*.
- Palme, M., Sunden, A. E. and Soderlind, P. (2007) How do individual accounts work in the Swedish pension system?, *Journal of the European Economic Association*, **5**, 636-646.
- Papke, L. (2003) Individual financial decisions in retirement saving plans: the role of participants-direction, *Journal of Public Economics*, **88**, 39-61.
- Premium Pension Authority (2007) Annual Report, Premium Pension Authority, Stockholm.
- Sethi-Iyengar, S., Huberman, G. and Jiang, W. (2004) How much choice is too much? Contributions to 401(k) retirement plans, In *Pension design and structure: New lessons from behavioral finance*(Eds, Mitchell, O. and Utkus, S.) Oxford University Press, Oxford.
- Sethi-Iyengar, S. and Kamenica, E. (2006) Choice overload and simplicity seeking, *University of Columbia Graduate School of Business Working Paper*.
- Singh, S., McKeown, W., Myers, P. and Shelly, M. (2005) Literature review on personal credit and debt, RMIT University.
- Summers, B., Ironfield-Smith, C., Duxbury, D., Hudson, R. and Keasey, K. (2005) Informed choice: consumer preferences for information on pensions, *Journal of Financial Regulation and Compliance*, **13**.
- Sunden, A. E. and Surette, B. J. (1998) Gender differences in the allocation of assets in retirement savings plans, *The American Economic Review*, **88**, 207-211.
- Tapia, W. and Yermo, J. (2007) Implications of behavioral economics for mandatory individual account pension systems (OECD Working Papers on Insurance and Private Pensions No 11), OECD.
- Uccello, C. (2000) 401(k) investment decisions and social security reform, *Center for Retirement Research Working Paper 2000-04*.
- Van Rooij, M., Kool, C. and Prast, H. (2007a) Risk-return preferences in the pension domain: Are people able to choose?, *Journal of Public Economics*, **91**, 701-722.
- Van Rooij, M., Lusardi, A. and Alessie, R. (2007b) Financial literacy and stock market participation, *University of Michigan Retirement Research Center, Working Paper 2007-162*.
- Vanguard (2008) How America Saves: A report on Vanguard 2007 Defined Contribution Plan data, Vanguard Group Inc.
- Vlaev, I., Chater, N. and Stewart, N. (2007) Relativistic financial decisions: Context effects on retirement saving and investment risk preferences, *Judgment and Decision Making*, **2**.
- Watson, J. and McNaughton, M. (2007) Gender Differences in Risk Aversion and Expected Retirement Benefits, *Financial Analysts Journal* **63**.
- Webb, C., Pye, J., Jeans, D., Robey, R. and Smith, P. (2008) Individuals' attitudes and likely reactions to the workplace pension reforms 2007: Report of a quantitative survey (DWP Research Report 550)

Annex 1: Full list of references

This is a full list of the literature that was reviewed and found to be relevant, some of which is not referred to in the report.

- Agnew, J., Balduzzi, P. and Sunden, A. E. (2000) Portfolio choice, trading and returns in a large 401(k) plan, *Center for Retirement Research Working Paper 2000-06*.
- Agnew, J. and Szykman, L. (2004) Asset allocation and information overload: the influence of information display, asset choice and investor experience, *Center for Retirement Research Working Paper 2004-15*.
- Association of British Insurers (2007) Retirement savings in the UK: The State of the Nation's Savings 2007/2008 (ABI Insurance Market Study No 4).
- Atkinson, A., McKay, S., Kempson, E. and Collard, S. (2006) Levels of financial capability in the UK: Results of a baseline survey (FSA Consumer Research Report 47), Financial Services Authority.
- Australian Prudential Regulation Authority (2007 (issued 2008)) Annual Superannuation Bulletin, Australian Prudential Regulation Authority.
- Australian Securities and Investments Commission (2006) Shadow shopping survey on superannuation advice.
- Bajtelsmit, V. L. and Bernasek, A. (1996) Why do women invest differently than men?, *Financial Counselling and Planning*, **7**.
- Banks, J., Emmerson, C. and Oldfield, Z. (2005) Preparing for retirement: The pension arrangements and retirement expectations of those approaching State Pension Age in England, *Institute for Fiscal Studies Working Paper WP05/13*.
- Benartzi, S. and Thaler, R. (2001) How much is investor autonomy worth?, *University of California-Los Angeles Working Paper*.
- Benartzi, S. and Thaler, R. (2001) Naive diversification strategies in defined contribution savings plans, *American Economic Review*, **91**, 79-98.
- Bernasek, A. and Shwiff, S. (2001) Gender, risk and retirement, *Journal of Economic Issues*, **35**.
- Brown, J., Liang, N. and Weisbenner, S. (2007) Individual account investment options and portfolio choice: Behavioral lessons from 401(k) plans, *Journal of Public Economics*, **91**, 1992-2013.
- Brown, K., Gallery, G. and Gallery, N. (2004) Superannuation choice: The pivotal role of the default option, *Journal of Australian Political Economy*, **53**.
- Bunt, K., Adams, L., Koroglu, Z. and O'Donnell, E. (2006) Pensions and pension reform (DWP Research Report 357).
- Byrne, A. (2007) Employee saving and investment decisions in defined contribution pension plans: survey evidence from the UK, *Financial Services Review*, **16**, 19-40.
- Choi, J. J., Laibson, D., Madrian, B. and Metrick, A. (2001) For better or for worse: default effects and 401(k) savings behaviour, *NBER Working Paper No. W8655*.
- Choi, J. J., Laibson, D. and Madrian, B. C. (2004) Plan design and 401(k) savings outcomes, *NBER Working Paper 2004-4*.

- Choi, J. J., Laibson, D. and Madrian, B. C. (2007) \$100 Bill on the sidewalk; suboptimal investment in 401(k) plans, *Yale ICF Working Paper*
- Choi, J. J., Laibson, D., Madrian, B. C. and Metrick, A. (2001) Defined contribution pensions: Plan rules, participants decisions and the path of least resistance, *NBER Working Paper No. W8655*.
- Choi, J. J., Laibson, D., Madrian, B. C. and Metrick, A. (2003) Passive decisions and potent defaults, *NBEW Working Paper 9917*.
- Clare, R. (2006) The introduction of choice of superannuation fund: results to date, Association of Superannuation Funds of Australia Research Centre.
- Clark, G. and Strauss, K. (2008) Individual pension-related risk propensities: the effects of socio-demographic characteristics and a spousal pension entitlement on risk attitudes, *Ageing and society*, **28**, 847-874.
- Clery, E., McKay, S., Phillips, M. and Robinson, C. (2007) Attitudes to pensions: The 2006 survey (DWP Research Report 434).
- Collard, S. and Breuer, Z. (2009) Attitudes towards investment choice and risk within the personal accounts scheme: Report of a qualitative study (DWP Research Report No. 565).
- Conquest Research Limited (2004) Consumer understanding of financial risk (FSA Consumer Research Report 33).
- Deloitte (2008) 401(k) Benchmarking Survey: 2008 Edition, Deloitte Consulting LLP.
- Diacon, S. (2002) Investment risk: A comparative study of the perceptions of consumers and advisers, *Centre for Risk and Insurance Studies Discussion paper series*, **2002.XI**.
- Distribution Technology (2005) Benchmarking UK consumer attitudes to risk, *News release dated 27/06/05*.
- Duflo, E. and Saez, E. (2002) Participation and investment decisions in a retirement plan: the influence of colleagues' choices, *Journal of Public Economics* **85** 121-148.
- Dulebohn, J. (2002) An investigation of the determinants of investment risk behaviour in employer-sponsored retirement plans, *Journal of Management*, **28**, 3-26.
- Embry, L. L. and Fox, J. J. (1997) Gender differences in the investment decision-making process, *Financial Counselling and Planning*, **8**, 33-40.
- Financial Services Authority (2006) Quality of advice process in firms offering financial advice: findings of mystery shopping research (FSA Consumer Research Report 52).
- Finke, M. and Huston, S. (2003) The brighter side of financial risk: Financial risk and tolerance and wealth, *Journal of Family and Economic Issues*, **24**.
- Finney, A. and Kempson, E. (2008 forthcoming) Consumer Purchasing Survey, *Consumer Research*.
- Gai, P. and Vause, N. (2005) Measuring investors' risk appetite, *Bank of England Working Paper 283*.
- Gallery, G. and Gallery, N. (2005) Paradox of choice in a mandatory pension savings system: challenges for Australian income policy, *Policy and Politics*, **33**, 519-532.
- Gerrans, P., Gardner, D., Clark-Murphy, M. and Speelman, C. (2006) An investigation of home bias in superannuation investment choices., *Economic Papers*, **25**, 17-31.
- Goodman, A. (Undated) Consumer understanding of risk, The Actuarial Profession.
- Grable, J. (2000) Financial risk tolerance and additional factors that affect risk taking in everyday money matters, *Journal of Business and Psychology*, **14**.

- Hall, S., Pettigrew, N. and Harvey, P. (2006) Public attitudes to personal accounts: report of a qualitative study, *DWP Research Summary*.
- Hall, S., Pettigrew, N. and Harvey, P. (2006) Public attitudes to personal accounts: report of a qualitative study (DWP Research Report 370).
- Harrison, T., Waite, K. and White, P. (2006) Analysis by paralysis: the pension purchase decision process, *International Journal of Bank Marketing*, **24**.
- Hewitt Associates LLC (2007) Trends and experience in 401(k) plans: 2007, Hewitt Associates LLC.
- Hey, J. D. (2008) Exploring the experimental economics approach in pensions (DWP Working Paper 43).
- Huberman, G. and Jiang, W. (2006) Offering versus choice in 401(k) plans: Equity exposure and number of funds, *Journal of Finance*, **61**, 763-801.
- IFF Research (2006) Investment disclosure research, *Consumer Research* **44**.
- IFF Research (2007) Investment risk rating: Consumer attitudes towards risk, Financial Services Consumer Panel.
- Iyengar, S. and Lepper, M. (2000) When choice is demotivating. Can one desire too much of a good thing?, *Journal of Personality and Social Psychology*, **79**, 996-1006.
- Jianakopulos, N. A. and Bernasek, A. (1998) Are women more risk-averse?, *Economic Enquiry*, **36**, 620-630.
- Kahneman, D. and Tversky, A. (1979) Prospect theory: An analysis of decision under risk, *Econometrica*.
- Korniotis, G. M. and Kumar, A. (2008) Do older investors make better investment decisions?, *Working paper*, available at <http://ssrn.com/abstract=767125>.
- Loretto, W., White, P. and Duncan, C. (2001) Thatcher's children, pensions and retirement: some survey evidence, *Personnel Review*, **30**.
- Lucas, L. (2002) Meeting the financial planning needs of a diverse and paradoxical 401(k) population, *Benefits Quarterly*, **Fourth Quarter**.
- Madrian, B. C. and Shea, D. F. (2000) The power of suggestion: Inertia in 401(k) participation and savings behavior, University of Chicago and NBER; United Health Group.
- Madrian, B. C. and Shea, D. F. (2001) The power of suggestion: Inertia in 401(k), participation and savings behavior, *Quarterly Journal of Economics*.
- Madrian, B. C. and Shea, D. F. (2001) Preaching to the converted and converting those taught: Financial education in the workplace, *University of Chicago Working Paper*.
- Martenson, R. (2005) Success in complex decision contexts: The impact of consumer knowledge, involvement and risk willingness on investments in mutual funds and stocks, *International Review of Retail, Distribution and Consumer Research*, **15**, 449-469.
- Melkumian, A. A. (2006) The opportunity cost of being constrained by the type of asset: bonds only or stocks only, *Journal of Applied Economics*, **9**, 325-343.
- Palme, M., Sunden, A. E. and Soderlind, P. (2004) Investment choice in the Swedish Premium Pension Plan.
- Palme, M., Sunden, A. E. and Soderlind, P. (2007) How do individual accounts work in the Swedish pension system?, *Journal of the European Economic Association*, **5**, 636-646.
- Papke, L. (2003) Individual financial decisions in retirement saving plans: the role of participants-direction, *Journal of Public Economics*, **88**, 39-61.

- Papke, L. E. (1998) How Are Participants Investing Their Accounts in Participant Directed Individual Account Pension Plans?, *The American Journal Review: AEA Papers and Proceedings*, **88**, 212-216.
- Powell, M. and Ansic, D. (1997) Gender difference in risk behaviour in financial decision making: an experimental analysis, *Journal of Economic Psychology*, **18**, 605-628.
- Premium Pension Authority (2007) Annual Report, Premium Pension Authority, Stockholm.
- Reuters (2008) New retirement research shows positive retirement savings behavior does not equal a confident outlook for the future. (Reuters press release dated 05/02/08, www.reuters.com).
- Sethi-Iyengar, S., Huberman, G. and Jiang, W. (2004) How much choice is too much? Contributions to 401(k) retirement plans, In *Pension design and structure: New lessons from behavioral finance*(Eds, Mitchell, O. and Utkus, S.) Oxford University Press, Oxford.
- Sethi-Iyengar, S. and Kamenica, E. (2006) Choice overload and simplicity seeking, *University of Columbia Graduate School of Business Working Paper*.
- Singh, S., McKeown, W., Myers, P. and Shelly, M. (2005) Literature review on personal credit and debt, RMIT University.
- Summers, B., Ironfield-Smith, C., Duxbury, D., Hudson, R. and Keasey, K. (2005) Informed choice: consumer preferences for information on pensions, *Journal of Financial Regulation and Compliance*, **13**.
- Sunden, A. E. (2004) How do individual accounts work in the Swedish pension system?, *Center for Retirement Research Issue in Brief*.
- Sunden, A. E. and Surette, B. J. (1998) Gender differences in the allocation of assets in retirement savings plans, *The American Economic Review*, **88**, 207-211.
- Sunden, A. E. and Surette, B. J. (1998) Gender differences in the allocation of assets in retirement savings plans, *The American Journal Review: AEA Papers and Proceedings*, **88**, 207-211.
- Tapia, W. and Yermo, J. (2007) Implications of behavioral economics for mandatory individual account pension systems (OECD Working Papers on Insurance and Private Pensions No 11), OECD.
- Uccello, C. (2000) 401(k) investment decisions and social security reform, *Center for Retirement Research Working Paper 2000-04*.
- Van Rooij, M., Kool, C. and Prast, H. (2007) Risk-return preferences in the pension domain: Are people able to choose?, *Journal of Public Economics*, **91**, 701-722.
- Van Rooij, M., Lusardi, A. and Alessie, R. (2007) Financial literacy and stock market participation, *University of Michigan Retirement Research Center, Working Paper 2007-162*.
- Vanguard (2006) How America Saves 2006, Vanguard Center for Retirement Research.
- Vanguard (2008) How America Saves: A report on Vanguard 2007 Defined Contribution Plan data, Vanguard Group Inc.
- Vlaev, I., Chater, N. and Stewart, N. (2007) Relativistic financial decisions: Context effects on retirement saving and investment risk preferences, *Judgment and Decision Making*, **2**.
- Wang, H. and Hanna, S. (1997) Does risk tolerance decrease with age?, *Financial counselling and planning*, **8**.
- Watson, J. and McNaughton, M. (2007) Gender Differences in Risk Aversion and

- Expected Retirement Benefits, *Financial Analysts Journal* **63**.
- Weaver, R. (2005) Design and implementation issues in Swedish Individual Pension Accounts, Center for Retirement Research at Boston College.
- Webb, C., Pye, J., Jeans, D., Robey, R. and Smith, P. (2008) Individuals' attitudes and likely reactions to the workplace pension reforms 2007: Report of a quantitative survey (DWP Research Report 550)