The London School of Economics and Political Science

The Cost of Choice: Should We Be Free to Choose When it Comes to Our Pension?

By

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Declaration

I certify that the thesis I have presented for examination for the MPhil/PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

I declare that my thesis consists of 70,598 words.

Statement of conjoint work
I confirm that chapter 6 was jointly co-authored with Dr Heather Kappes and I contributed 80% of this work.

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To LSE for teaching me how to learn. To David and Sandy for raising my game. To my family for putting up with me in the process.

Abstract

This thesis asks to what extent should we be free to choose when it comes to our pension? Three perspectives were considered: that of the state; that of the employer; and that of the individual.

The thesis starts by examining the issue from an institutional perspective. Using the example of three different countries' pension policies, it argues that there is a trade-off between maintaining private incentives to save and cost. If pension saving is compulsory, then the state is free to target money at those most in need (which is more cost effective). If pension saving is voluntary, then the state needs to invest heavily in creating a structure that rewards private saving (through tax incentives and the reduction of means testing).

The second part of the thesis is a qualitative study that looks at choice from the perspective of the employer. The UK government has restricted its role to poverty relief and occupational pension saving is expected to bridge the gap between needs and aspiration in retirement. However, employers are allowed considerable discretion over how much they contribute to their employees' pensions. Fifteen private sector employers were interviewed to uncover the logic behind the design of their pension offer. It found that few profit-seeking employers saw any commercial advantage to paying in the form of a pension.

Finally, the thesis looks at choice from the point of view of the individual. Using three experimental studies it asks, if given choice, do individuals go on to make 'good' choices. The first experiment recasts the issue of whether people are saving 'enough' for their retirement by looking at the job choice itself. The following two experiments look at the impact that financial communication has on pension engagement.

In conclusion this thesis argues: (i) it is expensive to design a system that will incentivise voluntary saving; (ii) profit seeking employers see little commercial advantage to paying in the form of a pension; and (iii) many individuals fail to respond to the incentives to save because of almost insurmountable information problems. The current UK pension system is founded on an ideological commitment to free choice, and this carries an unduly heavy cost, not only for the individual, but also for the state.

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1 Introduction

> *Till meeting them I had never realized that there are people in England who live on nothing but the old-age pension, often shillings a week. None of these old men had any other resource whatever. One of them was talkative, and I asked him how he managed to exist. He said: 'Well, there's ninepence a night for yer kip--that's five an' threepence a week. Then there's threepence on Saturday for a shave-- that's five an' six. Then say you 'as a 'aircut once a month for sixpence --that's another three'apence a week. So you 'as about four an' four-pence for food an' bacca'. He could imagine no other expenses. His food was bread and margarine and tea--towards the end of the week dry bread and tea without milk - and perhaps he got his clothes from charity. He seemed contented, valuing his bed and fire more than food. But, with an income of ten shillings a week, to spend money on a shave -it is awe-inspiring." (Orwell, 1933 p.135)*

This thesis is about pensions and choice; it asks to what extent we should be free to choose how to save for our retirement? As a previous Pensions Minister[1] suggested, should we be free to take out all our pension savings at the age of fifty five and buy a Lamborghini (Cumbo, 2014)? Or should the state, like a wise parent, force or nudge us towards prudence. In all rich societies the 'choice' to retire in absolute poverty has been effectively removed. And that short sentence is no small triumph. It is common when writing about pensions to adopt a catastrophic tone. The World Bank (1994), referred to the 'looming' crisis that threatened not only the old, but their children and even their grandchildren. This sense of doom is nothing new. Clark, Munnell & Orzag (2006) describe how from the 1920s to the 1950s "Europe was seized by panic about the aging of its population. Pessimistic forecasts were published of the coming increase in the proportions of older people, as birth rates fell and life expectancy rose" (p.45). More recently almost every contemporary academic or popular article about pension decision-making starts with a familiar litany: increasing life expectancy, decreasing support ratios, state retrenchment and economic crisis. So while it is legitimate to focus on the challenges, we should

[1] Steve Webb, UK Minister of State for Pensions 2010 – 2015.

nevertheless remember just how far we have come. As the quotation from George Orwell at the start of this chapter makes clear, what it means to rely on the state pension alone has been transformed since the 1930s. The OECD (2013) argues that the reduction of poverty in old age has been one of the greatest success stories in OECD countries. In the UK the percentage of pensioners in relative poverty was close to an historic low in 2010/11, and pensioners were less likely to be in relative poverty than the population as a whole (Department for Work & Pensions, 2013).

Yet, while nearly all rich states have addressed the problem of absolute old age poverty, they are nevertheless left grappling with the more slippery matter of income aspirations in retirement. The crisis, if one uses that term, is not one of keeping the elderly out of poverty, but of middle class expectations about replacement rates. Middle-earners are the group of people who are at highest risk of not having sufficient retirement income (OECD, 2013). In response to this challenge, states have adopted very different approaches to where and how much choice should be allowed in saving for retirement; and it is the logic of these different systems that is at the heart of this PhD.

1.1 What is a Pension?

Blake (2006) defines a pension as: a stream of payments that starts when someone retires and continues in payment until they die' (p.1). This definition, with its recipe for lifetime income security for however long the retiree lives, is arguably now somewhat anachronistic. For most, a pension (beyond that offered by the state) might be better described as a tax favoured savings scheme that will provide a lump sum around retirement to do with what you will.

The following chapter goes into a more detailed discussion; however, the two most basic distinctions are between how a pension is *funded*, and how it is *paid out*. In terms of funding, the crucial distinction is between a funded and unfunded (or Pay As You Go (PAYG) system). In a funded pension, contributions are paid into a fund, which is invested, and pensions are then paid out of this pot. A PAYG system is where pensions are paid out of current income, and no funds are put aside to pay future pensions. Most state pensions are of the PAYG type. They are essentially contracts between generations: the working population pays the pensions of the retired in expectation that when they retire the younger generation will in turn pay their pension. In terms of how the pension is paid out, the principal distinction is that between a defined benefit pension (DB) and a defined contribution pension (DC). The former is where the pension paid out is calculated in

relation to the members' salary or some other value that is fixed in advance. In contrast, in a defined contribution pension, the amount of money that will be paid out is based on the contributions made, the charges applied and the investment returns achieved.

This thesis largely focusses the discussion on occupational pensions. The state pension, funded through taxes, is an area where there is very little choice to be exercised by the citizen. Having said that, discussion is given to the shape of the state pension in the literature review and in chapter 4, as its structure inevitably shapes and constrains many of the choices that we make. A much-repeated theme of this thesis is the fact that different parts of a pension system cannot be considered in isolation.

Finally, it also needs to be pointed out that a pension is not the only way to provide financially for retirement. For example, for some people, housing wealth (with all its tax advantages) is likely to be a more significant asset than their pension savings. Some popular commentators have argued that ISAs[2] are a more flexible way to save for retirement. Nevertheless, for the bulk of the population, an occupational pension is the primary way through which savings can be built up for retirement.

1.2 Structure of the PhD

To answer the question of how much choice we should be allowed when it comes to our pension, three perspectives are taken. That of the state, that of the employer and that of the individual. The state defines the rules, the employer has a major role in paying for and delivering occupational pensions, the individual bears the responsibility of making choices for their future self.

The thesis proceeds as follows: Chapter 2 gives a brief overview of the terminology and typology of pensions and can be skipped by any reader familiar with the field. Chapter 3 is the literature review. Chapter 4 is a comparative analysis of three pension systems: Australia, the UK, and Sweden. It looks at the logic behind the very different sets of policy choices that these countries have made over how and where to encourage choice or compel retirement saving. The purpose of this chapter is twofold. First, to provide the wider context for the later chapters. Second, to make the argument that when it comes to the design of a pension system there are two fundamentally coherent choice sets, and that

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[2] ISAs: Individual savings accounts which allow individuals to hold cash, shares and unit trusts free of tax on dividends, Interest and capital gains. The ISA allowance was £15,000 per year in 2015-16.

the pursuit of free choice carries a heavy (hidden) price tag. The core of the argument is that there is an 'impossibility triangle' (Bozio, Crawford, & Tetlow, 2010) which means that it is not possible to have a set of pension policies that (i) remove income poverty (ii) without disincentives and (iii) at a low cost. A state can only achieve two out of those three objectives. If pension saving is compulsory, then the state is free to target money at those most in need (which is more cost effective). If pension saving is voluntary, then the state needs to invest heavily in creating a structure that rewards private saving (through tax incentives and the reduction of means testing).

Chapter 5 reports the results of a qualitative study that considers the perspective of the employer. In a series of fifteen interviews it asked employers what the rationale was behind their pension design. There are two principal ways through which one can consider the incidence of occupational pensions: from the demand side (what is it that affects employee demand for pensions) and from the supply side (reasons other than employee demand for why employers might want to provide pensions). Three propositions were put forward: (i) there are no supply side benefits to the firm in providing defined contribution occupational pensions; (ii) employees undervalue occupational pensions because of bounded rationality and bounded self-control; (iii) as a consequence of proposition 2, firms will respond to reduced demand either by offering the minimum level of pension provision required by the state, or by designing flexible pensions to target pension spending at those employees who place the highest value on pensions.

Chapters 6 to 8 turn to consider the perspective of the individual in a series of three experiments. The first experiment recasts the issue of whether people are saving 'enough' for their retirement by looking at the job choice itself. Arguably your job choice (whether you choose a job with a 'good' pension or not) will potentially have a much larger impact on your later financial health than the isolated decision to save a few percent more or less. Consequently chapter 6 reviews the results of an experimental study that tested: (i) the impact that a pension of varying generosity had on the perception of the attractiveness of the job, and perceptions of company culture; (ii) the extent to which different groups of people might be more or less inclined to find a job package that favours a pension more attractive; and (iii) whether the framing of the company's pension plan had an impact on perceptions of the attractiveness of the job or company culture.

Chapters 7 then turns to ask whether financial communication can improve pension engagement? The UK government has restricted its role to providing poverty relief in retirement, and if few employers see any commercial incentive to provide occupational

pensions above the legal minimum, can education help the young make the right choices? Drawing on the Risk-as-Feelings hypothesis of Loewenstein et al. (2001) this experiment considers the role of affect in communication. Put prosaically, are we driven by our heart, or our head, when making pension choices?

Chapter 8 repeats the experiment in chapter 7 with an older pool of participants. It asks if financial education falls on more fertile ground with individuals who are closer to retirement, and thus might be assumed to be more engaged with thinking about pensions.

Chapter 9 concludes. Economic freedom is a valuable commodity. In Milton Friedman's words: "An essential part of economic freedom is freedom to choose how to use our income: how much to spend on ourselves and on what items; how much to save and in what form; how much to give away and to whom" (Friedman & Friedman, 1990 p.89). Yet, as this thesis goes on to argue: first, it is expensive for the state to design a system that will incentivise voluntary saving; second, even if you do design such a system, the evidence is that many individuals will still not respond to these incentives as they should because of almost insurmountable information problems; finally, profit-seeking employers will find little incentive to provide a costly benefit that their employees do not understand or value.

2 Terminology and Typology

Before commencing with a review of the literature some key definitions, and the principal ways in which pensions are organised, are discussed. This section can be skipped by any reader familiar with the field.

2.1 What is a Pension?

Blake defines a pension as "a stream of payments that starts when someone retires and continues in payment until they die. In other words, a pension provides lifetime income security in retirement for however long the retiree lives" (Blake, 2006 p.1). However, as noted in the introduction, a pension of this type is becoming a somewhat rarer beast. Increasingly, for most people, a pension (aside from the state pension) is a tax favoured way of accumulating a lump sum to help fund their retirement.

2.2 Objectives of a Pension System

Barr (2004) argues there are three primary objectives for any pension system: (i) to prevent poverty in retirement for the life time poor, this involves some degree of redistribution; (ii) a mechanism for smoothing income, i.e. a way for people to smooth their consumption over their life time; and (iii) insurance, a way to insure against the risk of outliving one's wealth - this is the essence of an annuity. A good (or coherent) pension system will have different elements such that the whole fits together to address all three primary objectives. From a managerial perspective, one might also want to consider pensions as a tool to build loyalty and provide an orderly transition from work to non-work. Barr's key contribution is to clarify and tease out that which is often obscured and confused in the debate on the economics of pensions. From an individual point of view the principal purpose of a pension is to smooth income over a lifetime. As Barr notes, this can be done *only* in one of two ways: (i) by storing production (possible with housing, but less practical when it comes to food), or (ii) by acquiring a claim to future production. Acquiring a claim can be done in two ways: either by saving part of one's wages to build a store of money (or assets), or by obtaining a promise – from one's child, one's employer, or the state. In practice acquiring a claim is the most practical way to smooth consumption (apart for some goods such as housing). The precise form that this 'claim' takes can be organised in many

different ways. The two basic distinctions in terms of pensions design are a function of (i) how a pension is funded, and (ii) how it is paid out.

2.3 Key Terms

Funded v PAYG

In terms of funding, the crucial distinction is between a funded and (unfunded) PAYG system. The former is when pension contributions are paid into a fund, which is invested, and pensions are then paid out of this pot. A PAYG system is where pensions are paid out of current income, and no funds are put aside to pay future pensions. Most state pensions are of the PAYG type. The major implication of a PAYG system is that you are able to relax the assumption that the benefits received by one generation must be matched by its contributions.

The economic theory underpinning a PAYG system was articulated by Paul Samuelson in 1958, and developed by Aaron in 1966, and show that as long as incomes rise steadily it is possible in principle for every generation to receive more in pension that it pays in in contributions (P. Johnson, 2006). In a funded pension the rate of return will be determined by the long run return on investments. In contrast, in a PAYG pension system, the return is determined by the growth of the public pension tax base, which is itself determined by the rate of growth in real earnings. In other words when populations are growing and economic growth is high, then PAYG pensions will look attractive compared to funded pensions, and it is indeed possible for every generation to receive more in pension that it pays in in contributions. However, as Johnson illustrates with a simplified example, the reverse is also true. PAYG pensions are highly sensitive to demography and economic growth. If a population begins to shrink (and consequently there are fewer working young to support more non-working old) then some generations may find that they have paid more in contributions than they will receive in benefits.

Defined Contribution v Defined Benefit

In terms of how the pension is paid out, the principal distinction is that between a defined benefit pension (DB) and a defined contribution pension (DC).

Defined Benefit: A DB pension is where the pension paid out is calculated in relation to the members' salary or some other value that is fixed in advance. With DB pensions, there is a further distinction between schemes based on final salary earnings or

career average earnings. In brief, in final salary schemes the pension paid out in retirement is based on the final year (or the average of the last few years) of earnings. For example, if you had worked for a firm for 40 years, and retired on earnings of £30,000 and had a pension plan with an accrual rate of 1/60 your pension would be as follows: 40 x 1/60 x £30,000 = 2/3 x £30,000 = £20,000. In other words, for each year you worked, you earned a retirement income of $1/60^{th}$ of your final salary. This type of scheme, once common in the public sector, is now increasingly being replaced with career average schemes. Here the pension earned is calculated as an average of the salary earned during the member's career. For example, the SAUL pension scheme is a career average revalued earnings scheme (CARE), where the average salary calculation is corrected for inflation to prevent inflation eroding the final value.

Defined Contribution (DC): With a DC scheme, it is the contributions not the pay-out that is defined. Typically, contributions are a fixed percentage of salary, and both employees and employers will contribute. Here no particular outcome is promised, and if contribution levels are low, investment returns are poor, charges are high, or longevity increases, then the final pension will be correspondingly low. By definition a DC pension scheme does not have the problem of deficits.

Deficits

Surpluses, or (more commonly) deficits, arise when the value of the assets in the fund do not balance with the value of the liabilities. Liabilities are calculated as the present value of the future promised payments. These promises are normally based on: the individual's salary, the number of years that the individual has been a member of the scheme and the accrual rate applied to the scheme. Valuing these liabilities is a complex calculation as there are a large number of unknown factors. Typically, there are three classes of member in a pension scheme: active members who are still employed by the sponsoring employer and who are accruing benefits; deferred members who are no longer building up benefits but have preserved pension rights that might not start for many years; and retired pensioner members who are receiving their pension.

To calculate expected liabilities a number of assumptions must be made about the following ("Defined Benefits: valuing and managing liabilities," 2017):

- How much will the earnings of those members still employed by the employer increase between now and their expected retirement?

- How long will active members continue to accrue benefits in the scheme?
- How will inflation affect the value of pensions in payment and the revaluation of deferred benefits?
- What assumptions are required to revalue guaranteed minimum pensions?
- What proportion of active and deferred members will survive until the schemes Normal Pension Age to claim their pension?
- How long is each current and future pensioner expected to live?
- How many members will have surviving dependents to who pensions will be payable and how long will they typically live?
- What discount rate should be applied to a benefit expected to be paid in the future, to estimate how much money might be needed today to be reasonably confident that the benefit can be paid?

Risk

One of the key implications of a DB or DC pension is who bears the risk? With a DC plan, risk is almost completely passed on to the individual. The employer makes their contribution, and there their responsibility ends. In contrast with a DB scheme most risk is retained by the employer, if contributions or returns on assets are not high enough, if people live longer than expected, then the employer (or sponsoring organization) is responsible for the deficit. Here most risk is with the sponsoring organization. See Blake (2006) for a discussion of how different pension schemes share risk.

Hybrid Schemes

There are also hybrid schemes which mix aspects of DC and DB design. Two examples are described below (see Blake, 2006 for more detail).

Notional schemes: A notional scheme mimics many of the features of a defined contribution plan, but is funded on a Pay As You Go (PAYG) basis. In a notional defined contribution plan, unlike a normal PAYG plan, workers contributions are recorded in a notional account belonging to each worker but not actually invested (as with a normal defined contribution system). This notional amount has a growth rate applied to it, for example that of the growth in the earnings base (as this is where the money to pay it ultimately comes from). The advantage of notional DC plans is that they make the link

between contributions and benefits more explicit. Sweden (discussed in chapter 4) provides an example.

Risk sharing schemes: One example of a risk sharing scheme is that offered by the New Brunswick Shared Risk Pension Plan (Munnell & Sass, 2013) which functions as a DB plan, but incorporates some degree of flexibility in cases where deficits arise. The approach here was to split the pension into a highly secure 'base' benefit, and a moderately secure 'ancillary' benefit which is only paid out in full if the plan's funds allow. Funding is designed so that all benefits will be paid out with a very high degree of likelihood, and there are clear protocols of what to do should shortfalls arise. In contrast to a DB plan where if there is a shortfall the entire burden falls on the sponsoring organisation, here it shares the burden between the employer, the current employees and pensioners. Ancillary benefits not granted in bad years can be expected to be restored in good years

Charges

As Barr & Diamond (2010b) note, the impact of pension charges should not be underestimated. A less obvious, but nevertheless crucial, difference between a defined benefit and defined contribution pension is who bears the cost of running the scheme. In a defined contribution scheme, unlike a defined benefit scheme, charges will directly impact the members' benefits. Few people understand the impact that this can have on their pension. As The Department for Work and Pensions state (*Pension Charges Survey 2016: Charges in defined contribution pension schemes*, 2017), an ongoing charge of 0.5% on a pension, can over a working life, reduce the overall value of a members retirement by 11%. A one percent ongoing charge will reduce it by around 21%. The costs of market provision of pension can be very high and very few understand the impact that a seemingly small amount can have on their ultimate income. While the later studies in this thesis do not look in detail at this aspect of the costs of choice, it should not be underestimated.

Inflation

It is also key to point out the centrality of inflation to pensions. In the past, most private pensions were DB, and these often (and in the UK, post 1985, always) increased in line with inflation. However it has been gradually recognised that it is difficult for private firms to protect against inflation (Stiglitz & Rosenguard, 2015). A level pension (i.e. one that does not increase with inflation) relies on a calculation of mortality. This is a risk that can be calculated, as death is (bar exceptional circumstances such as war) an 'independent'

event[3]. In contrast inflation is not an independent risk. If inflation increases suddenly, any firm that has promised inflation-linked pensions, has to pay out for everyone. Arguably only a government, that has the power to raise taxes and share costs across generations, is in the position to provide insurance against inflation.

The Three Pillars

A further way that pensions are often discussed is through the idea of the three pillars, a terminology introduced by the World Bank in 1994[4]:

Pillar 1: Is state provided social security. There are two main types: 'Beveridgean' and 'Bismarckian'. The 'Beveridgean' (named after William Beveridge, creator of the blue print for the UKs' post WWII welfare state) provides just sufficient to keep people out of poverty. The 'Bismarckian' (named after Otto von Bismarck, creator of the modern welfare state in Germany in the 1880s) is more generous and links payments to more generous replacement rates.

Pillar 2: This is the pension provided by companies in the form of occupational pension schemes. In the private sector they are typically funded, and (now) typically DC. In the public sector you find a mixture of funded and unfunded schemes, and while they are still mainly DB this is coming under some pressure.

Pillar 3: This covers any additional savings made for retirement – for example private DC pensions, or more commonly the home.

2.4 Concluding Comments

Finally, while it is often taken at face value that funded pensions are more efficient[5], Barr's central insight is that from the perspective of society as a whole, the economic function of both funded and PAYG pensions are the same: to divide the total output between workers and the retired. In other words, however a pension system is funded, pensioners can only

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[3] That is the probability of a pensioner living to a certain age is independent of the probability of other pensioners living to a certain age. So, firms can calculate, to a reasonable degree, average life expectancy. In contrast inflation is not an independent event. If inflation increases, it increases for everyone, and so it is far harder for firms who provide inflation linked pensions to insure against this risk (Barr, 2004).

[4] This classification of the 'three pillars' was subsequently extended into five pillars by Holzmann & Hinz (2005) of the World Bank.

[5] Because funding encourages saving, and thus encourages investment.

consume what workers do not consume[6]. In consequence there are four, and only four, possible ways in which pension finance can be improved:

- Increasing output.
- Reducing living standards of workers by increasing contributions.
- Reducing the living standards of pensioners by reducing benefits.
- Raising the retirement age. This has the effect of increasing the number of workers and simultaneously reducing the number of pensioners.

[6] However, Barr acknowledges that this argument is based on a highly simplified model:
A) If changes in productivity and labour force participation are influenced by the funding v PAYG choice, and if funding leads to higher productivity and labour market participation, then funding might be more efficient.
B) In addition it is often argued that funding imposes greater discipline on governments. With PAYG systems it is easier to make expensive promises that have to be funded by (another government) in the future.

3 Literature Review: The Invention of Retirement

> *"The problem of the nature and extent of the provision to be made for old age is the most important, and in some ways the most difficult, of all the problems of social security"* (Beveridge, 1942 para.239)

3.1 Introduction

The idea of retirement (and thus the need for a pension) is an invention of the late 19th and early 20th century. Retirement as an extended period of well-earned leisure that lasted for 20 or more years is an even more recent invention (Thane, 2006a). Before this time, the overwhelming majority of people did not retire, they usually worked until they died. From an individual perspective we want pensions to do two things: to smooth consumption over our lifetime, and to provide some insurance against the risk of outliving our wealth (the essence of an annuity[7]). In addition, the state usually has other objectives, namely poverty relief and, as a result, redistribution. Finally, the employer, often charged with paying for and delivering pensions, also has their own set of interests. The history of the UK pension system could be described as the competing pull of these, often conflicting, objectives.

3.2 Organising Principles and Methodology

The issue of pensions cuts across social science disciplines. Clark et al. (2006) describe the major themes and academic traditions that define the field ranging from economics, philosophy and political science. An adequate answer to 'how much choice we should have when it comes to our pension' needs to be informed by multiple perspectives. It takes about forty years to save for a pension, so history really matters; there is often a gap of decades between the time some decision or change is made and the time it comes into effect. The American Civil war ended in 1865, but the pension obligations it created spanned three centuries: Mrs Gertrude Janeway, who married a civil war veteran in 1927

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[7] Barr argues that annuities increase individual welfare by reducing the need for people to accumulate very large sums in case they live longer than they expect. However, most annuities that are bought (by those with DC pension pots) are level, and thus offer no protection against inflation. We are currently in a period where we have almost forgotten what high inflation looks like (and what it does to real income). So, although level annuities can insure against the *risk* of life expectancy, they do not insure against the *uncertainty* of inflation. In practice while economists argue that some degree of annuitisation is a good idea (Davidoff et al., 2005; Yari, 1965), they are also widely unpopular with consumers (Gardner & Wadsworth, 2004).

(when he was 81 and she was 18) received a pension check until she died in 2003 (Coggan, 2011). The decisions we take, the promises we make, are likely to have very long-term consequences.

This chapter proceeds as follows: First the history of the UK pension system is described. Next the economic perspective on pensions is outlined. This section looks at the classical, behavioural and institutional schools of thought. Finally, there is a brief review of the philosophy of choice. Ultimately the answer to the question of how much choice we should have when it comes to our pension is a normative one and will be heavily informed by one's perspective on individual liberty and the appropriate limits of state intervention.

3.3 History of the UK Pension System

Barr (2004) divides the history of the welfare state post war into three periods. First, he describes the post war period of consolidation and gradual extension of the pension system. In this period the flat-rate pension introduced by Beveridge in 1946 was gradually supplemented by earnings related contributions and benefits. This increased both the generosity and the cost of the system, and increased the level of redistribution from rich to poor. The next period was one of attempted retrenchment. Thatcher's government radically cut back on pension entitlement in its goal of reducing public spending. The third period was that of New Labour, which attempted to find a middle ground between increased spending on redistributive policies to increase welfare, and the need for efficiency. Arguably we are now in a fourth period, one which has circled back, somewhat tortuously, to Beveridge's initial design. The UK has, for the first time, a state pension very close to the model that Beveridge originally intended: a flat-rate state pension, set just above the poverty level to avoid means testing[8], providing a firm foundation for private saving (Crawford, Keynes, & Tetlow, 2013).

This thesis primarily focusses on occupational pensions, as this is the area in which in most cases there is more room for choice. However, it is impossible to consider occupational pensions in isolation. Their development is crucially shaped by the design of

[8] There are a number of different ways of targeting pension resources. Barr & Diamond (2010a) distinguish between an affluence test – which screens out only the best off; an income test – which award benefits only to those on low incomes; and a means test - which includes both income and wealth when assessing eligibility for benefits.

the state pension. Consequently, this discussion of the history of pension systems first traces the development of the state system, then going on to discuss in more detail the evolution of occupational pensions.

3.3.1 History of the State Pension: 1908 – 2018

The end of the 19th century saw increasing disquiet about aged poverty. Industrialisation and urbanisation had made the plight of the very poor (whose numbers included many older people) large, visible and increasingly quantified (Thane, 2006a). The Parliamentary Select Committee on the Aged and Deserving Poor in 1899 drew attention to the desperate poverty that many of the old found themselves in: "cases are too often to be found in which poor and aged people, whose conduct and whose whole career has been blameless, industrious, and deserving, find themselves for no fault of their own, at the end of a long and meritorious life, with nothing but the workhouse or inadequate outdoor relief, as a refuge for their declining years" (Clark, 2006 p.13). But while the committee acknowledged the problem, it reinforced the common view that policy had to distinguish between the 'deserving' and 'undeserving' poor. On the continent, Germany introduced in 1884 the world's first system of compulsory national insurance for lower paid workers, which effectively provided pensions to those no longer able to work[9]. Bismarck's explicit aim, however, was to prevent the spread of socialism rather than the spread of poverty. Back in the UK, this period marked the beginning of a nationwide campaign for a state old age pension. Booth's meticulous research in the 1890s shed light on the incidence of poverty. He argued that poverty in old age could only really be prevented by a non-contributory tax funded pension, as most people (and especially women) simply did not earn enough to be able to realistically save for retirement.

The Old Age Pensions Act was finally introduced in 1908. It provided (for those of good character) a weekly, non-contributory, means tested pension for those over 70 who earned less than £21 per year. At the time average life expectancy was 48. The maximum pension paid was five shillings a week. This was deliberately set below subsistence, to provide an incentive to save, and for children to support their parents (Thane, 2006a).

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[9] This was funded from contributions from both employers and workers and thus was only open to those in regular employment. Consequently it excluded some of the poorest men, and the great majority of women (Thane, 2006a) and so was not an effective way to help those most in need. That, however, was not its purpose.

From the start two thirds of the claimants were women. The costs of this new pension were about the same as in the previous, discretionary, system of poor relief. The difference was that, for the first time, pensions were paid as of right – as long as you could meet the relatively strict requirements of good character – and were paid out at local post offices thus divorcing them from the stigma of the poor law.

Post-war period of consolidation: The defining moment for the UK pension system was 1942, when Sir William Beveridge published his report "Social Insurance and Allied Services" (Beveridge, 1942). This outlined his vision for the welfare state, and notably refrained from any restrictions based on moral character or deservingness that had been so prominent in previous policy (Renwick, 2017). In general pension reform was a central component of the development of welfare states throughout the developed world after the Second World War. The mass poverty of the great depression had demonstrated the weakness of 19th century liberal ideas of self-reliance and market solutions. At the same time countries like Germany, that had seen the entire savings of the middle class wiped out by hyperinflation, understandably saw the state as a far safer provider of pensions.

Beveridge's intention was for a fully funded scheme that would provide a flat-rate income for old age that just lifted people out of absolute poverty. Sickness and unemployment were also to be covered. However, politically it was considered imperative to pay pensions to those who had suffered the mass poverty of the depression and two world wars, and so a 'Pay as You Go' (PAYG) system was introduced instead (Bozio et al., 2010). The 1946 National Insurance Act saw the introduction of a basic state pension (BSP), based on flat-rate contributions, payable at 65 for men and 60 for women (life expectancy at this time was 59 for men and 65 for women). While this meant that many pensioners were doing better than before, the state pension was still set very low. In 1948 it was about 19% of average male annual earnings. This meant that, from the start, in contrast to Beveridge's vision, those without other means had to apply for means tested supplementary benefits (Brummer, 2010). Pemberton (2006) argues that this minimal state pension created the conditions for the development of a system of private occupational pensions on a vastly greater scale than Beveridge had ever envisaged. As discussed in more detail in the following section, it is during this post war period that occupational pensions really began to expand to the masses. So, for those relying only on the state pension, life after WWII was better than in Orwell's picture, but it was still pretty bleak.

In response to the paucity of the state pension, and with countries like Germany introducing universal earnings-related pensions, pressure grew to make the state pension

more generous. In 1959 the Labour manifesto included a proposal for a 'national superannuation' scheme that was based on a plan drawn up by Professor Titmuss of LSE. This was to be a nationally funded pension scheme offering earnings related supplementary pensions for all workers (at approximately 50% of final earning) (Hugh Pemberton et al., 2006 P.49). However, in the event the Conservatives, under Macmillan, won the 1959 election and implemented their own alternative solution to the problem of the aged poor: the graduated retirement benefit, introduced in 1961 (Bozio et al., 2010). Under this system, the flat-rate state pension was retained, but was supplemented by a not very generous earnings-related scheme. When the Conservative government introduced these changes, their view was arguably a short term political one. Pemberton et al. (2006, p. 51) cite Macmillan: "In the long run we shall all be dead and before some of these calculations mature we may well be a communist society or destroyed by a bomb. So, do not let us bother too much as long as we do not spend too much for the next two or three years". It is not just individuals who fail to take the long view. Crucially for the development of employer provided pensions, there was an opt-out for those employers who were offering an occupational scheme which was at least as good as the state supplementary scheme. Those employers were allowed to opt out of the higher contributions and the resulting higher state pension. This opt out was influenced by the lobbying of the private insurance companies, who feared a generous state second pension would eat into their business. So while the UK government took hesitant steps down the path of a continental style state provided earnings related pension, the opt-out would shore up the increasing importance of employer provided occupational pensions.

In 1964 the Conservative government lost to Wilson under Labour, and the Labour government promised to set up a funded, National Superannuation Scheme. This would have provided far more generous earnings-related benefits of the kind found in Europe. However, this plan was opposed by the Treasury (always virulently opposed to any earnings related promises on the grounds of cost), the financial services sector (who feared the loss of business), employers, and more surprisingly by unions. While the TUC generally backed a higher basic state pension, unions had fought hard to win generous occupational schemes for their members and did not want to weaken the value of this benefit (Whiteside, 2006 p.132). In the event, the Labour party lost the 1970 election to Edward Heath's conservatives, only returning to power in 1974. Wilson then had another attempt to introduce a more generous earnings related pension. In 1978 the 'State Earnings Related Pension Scheme' (SERPS) was introduced (Bozio et al., 2010). This offered for

the first time a full-scale second tier to the UK state pension that was earnings related (but also provided a degree of redistribution – for example to women). Financed through an increase of National Insurance contributions from both employers and employees, it was to pay out a pension of 25% of the employees' best 20 years of earnings. Crucially an opt out again applied: the reform permitted approved employer provided pension DB schemes to 'opt out' of the new second tier SERPS as long as the benefits provided were on a par broadly with SERPS provisions (Disney, 2016). However, as so often was the case, future costs had been hugely underestimated (or ignored)[10] and as Bozio et al. point out, once the true cost of the scheme became clear, future governments ended up watering down the promises made.

Retrenchment: 1979 was a pivotal year. Margaret Thatcher came to power, and the role of the state - in particular welfare - was to undergo a radical restructuring (although it should be noted that despite the rhetoric, the Thatcher government did not in fact succeed in its ambition of reducing government spending). The first step was to break the earnings link by which pensions were upgraded each year in line with earnings, instead linking them to the Retail Prices Index (RPI). Next SERPS was overhauled making it less generous (Disney, 2016). Taxpayers were offered a choice: they could remain in SERPS at a less generous rate, or they could contract out. Previously only employer run schemes had been allowed to contract out, now this freedom was extended to individuals. This new personal pension was brought in by the 1987 Finance act and was immediately popular – partly because of very aggressive sales practices of the main pension providers. The world looked rosy for the private pension customers and providers.

New Labour and the "Third Way": As Disney (2016) describes, the next major period of reform was under the new Labour Government of Tony Blair. 1999 saw the introduction of the new means tested benefit to supplement the basic state pension (BSP), the Minimum Income Guarantee (MIG), which was designed to help those in poverty. As the MIG was withdrawn pound for pound against any other private pension income, this was perceived to be a profound disincentive to saving. The MIG was then replaced by the

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[10] Johnson (2006 p.172) discusses the fact that when the costs of SERPS were being calculated, initial projections failed to take a sufficiently long term view. Introduced in 1978, the costs were not estimated beyond 2009, on the grounds that to look any further in the future than this would be highly speculative. Consequently projections failed to take account of the retirement of the post war baby boom generation, and the maturing of SERPS at the same time, both of which were entirely predictable, and both of which implied a huge increase in projected costs.

pension credit. The pension credit (PC) was made up of two parts: guarantee credit (PCGC) and savings credit (PCSC). The Pension Credit Guaranteed Credit played the role of the previous MIG – to keep people out of poverty. The Pension Credit Savings Credit was designed to reduce some of the disincentive implied by the MIG, but mainly succeeded to introduce even more unneeded complexity to the system. In addition, in 2002 SERPS was replaced by the state second pension (S2P). The S2P was made more generous for lower earners at the expense of higher earners.

During this period it was recognised that the pension system required major reform. Years of incremental changes to the system meant that it had become so complex that, in the words of Ruth Kelly, then economic secretary to the Treasury, "It is almost impossible for anyone to make rational choices [about their pensions]" (Hugh Pemberton et al., 2006 p.56). The value of the basic state pension had declined, and seventy years of tinkering with various earnings related and means tested supplements had led to a system of Byzantine complexity. The government therefore set up the Independent Pension Commissions to look at the challenges ahead, and their two reports (2004 and 2005) formed the basis for the next wave of significant reform.

The Pensions Commission made two key (and complementary) recommendations. First, with regard to occupational pensions, they recommended the creation of a low cost, funded (DC) pension savings scheme into which individuals would be automatically enrolled (but with the right to opt out). This scheme would have a modest level of compulsory matching employer contributions, and would have low annual charges. The second major recommendation was to reform the state system so that it was more flat-rate, with less means testing (and thus improved incentives to save privately). This would imply that the state pension would need to be more generous on average (to maintain the living standards of the poorest) and thus implied some mix of an increase in taxes devoted to pension expenditure, and an increase in the State pension age.

The Pensions Act of 2007 implemented many of the main findings of the Pensions Commission. It reduced the number of qualifying years needed to receive the full basic state pension (BSP) (this was particularly advantageous for women, who tended to spend longer periods out of employment) and linked increases in the BSP to earnings rather than prices (making it more generous). A less popular decision was to raise the pension age for women to 65 by 2020, and for both men and women to 68 between 2014 and 2046.

The 2008 Pensions Act introduced legislation for auto enrolment. As suggested by the Pensions Commission, for the first time, employers were to be required to enrol all

employees[11] into a pension scheme, and make contributions on their behalf (employees were allowed to opt out, but if they did so they lost the employer contribution). It was planned to begin in 2012, and was gradually rolled out with the largest companies first[12]. Contributions were initially set low (1% from employer and 1% from employee on banded earning) but were designed to gradually increase to 3% from employer and 5% (total 8%) from employee by 2019

A return to Beveridge? Freedom and choice: The reforms did not stop. The 2014 Pensions Act replaced the basic state pension (BSP) and the additional state second (S2P) pension with a new single flat-rate state pension. This new 'single-tier' pension was intended to be set at a high enough level to ensure that anyone with full entitlement would not require the means tested pension credit guarantee (thus reducing the problem of reliance on means testing which was perceived as undermining the incentive to save) (Crawford et al., 2013). In essence the system, after a long and torturous route, had now returned to a system that was similar in many ways to the design originally envisaged by Beveridge. A 'triple lock' was to guarantee that pensions rose in line with inflation, earnings or 2.5% - whichever was the highest (Disney 2016). The state now restricted its role to keeping people out of poverty, and auto enrolment was there to nudge people into providing for themselves some measure of income replacement.

And the change continues. In the 2015 budget, Osborne (then Chancellor of the Exchequer) introduced new pension freedoms, most notably the removal of the effective compulsion to buy an annuity. So, while employees were now to be nudged into saving through auto enrolment, at retirement, they were no longer constrained with how they could access this saving. In the 2016 budget the government, who had threatened to reduce the generosity of the tax breaks for higher earners, introduced a 'Lifetime ISA' or LISA. This was widely seen as an attempt to introduce the idea of pensions attracting tax relief at a lower flat-rate, rather than at the tax payer's marginal rate of taxation.

In sum, while UK governments have, in the past, flirted with a state provided second pillar this has never been very generous and typically, for the more affluent, pension saving beyond the minimal provision of the state has been privately managed. In

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[11] Only employees over the age of 22, and earning more than £10,000 are required to be automatically enrolled. Contributions are made on banded earnings of £5,876 - £45,000.

[12] Initially the plan was to start auto enrolment in 2012 so that by April 2017 all firms would have auto enrolled their staff. This was subsequently pushed back to 2019.

Bozio et al.'s (2010) words: "The history of the UK pension system is the story of a mainly non-contributory system, periodically tempted by the higher replacement rate of social insurance, but always frightened off by their cost" (p.5). The minimal provision of the state, consequently, left room for the symbiotic development of employer provided occupational pension plans (Sass, 2006).

3.3.2 History of Occupational Pensions in the UK

In their various forms, occupational pensions have a very long history. The earliest large employer was the state. In the late 18th century the British government started to offer pensions to important civil servants, for example to customs and excise officers, whose job it was to collect taxes. The pension here was to promote honesty. Previously those whose job it was to collect taxes had often financed their old age by selling their jobs (Clark et al. 2006). In 1859 the UK developed a pension plan for its civil servants which became the model for other large businesses that began to emerge at the end of the 19th century: railroads, utilities, and universities. As business historians such as Chandler (1977) describe, these large bureaucratic organisations that came to dominate the modern economy, required a special class of career employee that they could delegate authority to and trust. Larger and more hard-nosed employers felt the need to create conditions of cooperation and reciprocity, rather than conflict and arms-length dealing, with employees. The credible promise of a lifetime career, with a pension at the end, was one way to promote and reward loyalty (and punish disloyalty).

So while occupational pensions may have been provided for paternalistic reasons, they were also increasingly used as a managerial tool (Hannah, 1986). They were a way to control when employees should retire, to retain valued employees, to penalise early leavers. They were also a tool to fend off unions. Crucially, providing occupational pensions for much of the 20th century was relatively cost effective for employers (the reasons for which are discussed more fully below).

Nevertheless, in the first part of the twentieth century, employer provided pension plans were still not a mass phenomenon. As Sass (2006) argues, in this period the majority of employers had no interest in giving their employees a pension. In the 1930s employer occupational pension plans covered no more than 15% of the workforce in the UK, US and other industrial nations. It was only after the Second World War, when war shattered nations attempted to rebuild their economies that employer pensions came to cover a significant percentage of workers. Even then, employer plans were only an important part

of retirement systems in a subset of nations, and for a subset of workers (mainly middle and upper income male employees) (Sass, 2006).

Post WWII expansion and the rise of the DB pension: In the UK the minimalist level of the state pension was to create a fertile environment for the development of employer provided occupational pensions. Benign economic conditions, strong unions, and governments keen to foster voluntary saving all combined to foster a huge growth in private occupational pensions.

Employees wanted pensions that reflected their increasing earnings, and with the labour shortages after the war were in a strong bargaining position. The enormous post war expansion of public sector employment added to the growth in occupational pension coverage; in the 1960s and 1970s more than one million employees were transferred from the private to the public sectors (Hannah, 1986). But the large private sector employers were also expanding in these boom years after the war. Industries such as steel, autos and transportation were growing, as was union coverage, and they imitated the retirement plans that had evolved in the public sector. The tax treatment given to pensions further encouraged this. The taxation policy for pensions was largely designed before the war, when less than 10% of the adult population paid any income tax (Sass, 2006). However post-war income tax spread to the masses and now the tax advantages to pension saving became increasingly important[13], especially given the high levels of income tax post war[14]. The key reason for the expansion, however, was the growth of collectively bargained plans by unions. After the Second World War unions found themselves in a relatively strong position, coverage was high, and they were closely connected to the major left wing parties. While on the continent labour unions bargained for expanded government pensions, in the UK in contrast they pushed for more generous employer plans.

The state further encouraged the spread of occupational plans through its rules on contracting out. As described above, there were two main forays into state provision of earnings related pensions: first in 1961 with the introduction of the GSP, and then in 1978 with the introduction of the SERPs. In both cases the government encouraged employers

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[13] Tax policy in the UK was largely enacted in the 1920s, and as now, essentially defers all taxation on a pension to when the pension is paid out in retirement. In addition individuals are also allowed to take a 25% sum tax free.

[14] The top rate of income tax in the UK was around 90% through the 1950s and 1960s. It was cut to 75% in 1971.

to 'contract out'. That is, employers were offered a rebate on their National Insurance contributions if they took on the government's new earnings related pension obligation. To encourage this, the government set the value of the rebate above the employer's estimate of the cost of providing the benefit[15] (Sass, 2006).

The high-water mark in pension coverage was reached in 1967 when about half the working population was enrolled in an occupational pension. However even in this 'golden age' for pensions, coverage was very unevenly spread. While 60% of public sector workers were covered, private sector coverage was lower at 48%. From this point on the two sectors' fortunes diverged. Coverage in the public sector continued to grow, reaching 88% in 2000, while in the private sector it slowly declined to 38% in 2000 (Clark, 2006).

At this point the dominant model for both private and public sector workers occupational pensions was defined benefit. By 1979 ninety two percent of all UK pension funds were final salary defined benefit. However, by the end of the 20th century, private sector firms began to close DB funds and shift new members onto far less generous DC schemes. In 1995 there were 6.2 million active members of DB funds, by 2007 this had reduced to 900,000 (Avrahampour, 2008). What had caused this shift?

The Decline and fall of DB pensions in the private sector: While pension coverage gradually expanded until 1979, a number of large structural shifts in the economy and seemingly small changes in legislation began to seriously undermine occupational pension provision in the private sector. As Clark (2006) describes, in the 1990s the British political establishment was congratulating itself on the robustness and integrity of its pension system compared to its more profligate European neighbours. By the early 2000s there was considerably less confidence, and the Pensions Commission was established to look at a long-term solution. Pension coverage had stagnated since its high-water point in 1967, private DB plans were facing extinction[16] and the take up of DC plans had not made up the difference.

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[15] Although with hindsight the actual cost of providing these benefits may well have proved to be higher than originally estimated.

[16] While private firms were closing their DB pension plans, this did not put an end to their obligations. As Clark (Clark, 2006) notes, for many FTSE 100 firms the scale of pension obligations is likely to be a significant constraint on their operation.

So what was going on? The manufacturing industry, which had high levels of unionization, was in decline. The service sector grew, lifetime employment became less common, globalisation and competition made it hard for competitive industries to shoulder the enormous (and increasing) cost burden of DB pensions. The final nail in the coffin for DB pensions was arguably the change in accounting regulations. In sum, (i) changes in the structure of the economy, (ii) changes in the costs of providing DB pensions, and (iii) changes in how pension liabilities had to be reported, led to the gradual withdrawal of private sector employers from providing DB pensions.

Changes in the economy: The economy in the later part of the 20th century looked very different to that in the immediate post war period. In the post war period of reconstruction, the economy was dominated by large near monopoly public corporations. Unionisation was high, the labour market was tight, income taxes were high – all of which combined to make deferred tax advantaged compensation attractive.

It is hard not to see 1979 as a pivotal year. Margaret Thatcher was elected as Prime Minister, on a platform of deregulation, privatisation, labour market flexibility and reducing the power of unions. Privatisation shrunk public sector employment. Labour shortages changed into increasingly high unemployment, and now workers no longer had such strong bargaining power. Manufacturing began its steady decline from the 1960s, and with it union membership also began to wane (Kitson & Mitchie, 2014). Increased globalisation led to increased competition, which placed pressure on firms to rationalise costs. Large corporations were no longer able to generate monopoly profits, and found it harder to fund the increasing costs of pensions when other younger competitors (who had not built up such expensive liabilities) were nipping at their heels. In sum the economic conditions that had led to the enormous expansion of occupational pensions, now looked somewhat less benign.

The costs of providing DB occupational pension: In addition to changes in the economy, the costs of providing DB pensions began to climb. As noted earlier, providing occupational pensions for much of the 20th century was relatively cheap for employers. Hannah (1986) argues that this was for three main reasons: lower longevity, inflation, and lack of preservation of rights. The increase in longevity is well documented and is the most obvious change that has increased the cost of providing pensions, but arguably inflation and the lack of preservation rights did more to keep the costs down.

Life expectancy for those aged 65 has consistently increased. According to the latest Office for National Statistics figures, men and women in England can expect to live

for an additional 18 – 20 years once they hit the age of 65. In contrast in the 1960s the equivalent figures were 12 – 15 years[17].

The second big factor which kept down the cost of defined benefit pensions for employers was the lack of preservation rights. For much of the 20th C it was common for those who left a company to get their own contributions back (plus interest) but *not* their employer's contributions. These rules limiting leavers' rights was what made early schemes solvent; early leavers had subsidised the pay (albeit deferred pay) of those who maintained a lifelong commitment to the firm. The Social Security Act of 1973 forced pension schemes to preserve benefits after five years. This not only made the pension more expensive, but it also removed one of the advantages to the employer of providing a pension in the first place – namely its ability to reward loyalty. In addition, the contracting out requirements of SERPs also required two major improvements to schemes (both of which made them more expensive). They required a move to a final salary basis and a substantial improvement in widows' benefits (Hannah, 1986 p.71). As Hannah notes, because of a lack of preservation rights, early employers found occupational pensions a cost effective tool for most of the twentieth century, "neither the majority of those who have been members of occupational schemes nor the majority of their dependents have ever drawn a pension of any kind" (p.91).

The third major factor that helped employers meet the cost of pensions was inflation. For much of the 20th century the bulk of pensions promises were made in nominal terms, and so pension funds were able to in effect meet their money obligations, while welshing on their promises in real terms. For example, someone retiring on a 2/3rd pension in 1975 would have found his pension reduced to half of the original value in real terms in five years (Hannah, 1986 p.111). In the 1970s unions were successful in establishing complete index-linking of public sector pensions under Edward Heath's conservative government. However, by 1979 almost no schemes in the private sector offered complete index linking, although some offered guaranteed increases around the 3% level. In 1985 the government required inflation proofing of benefits of the lesser of 5% or the rate of inflation, and again this added to the cost of providing a defined benefit promise.

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[17] Office for National Statistics, 2015, How has life expectancy changed over time: https://visual.ons.gov.uk/how-has-life-expectancy-changed-over-time/

This took some time to play out, and the long stock market boom of the Thatcher/ Reagan years concealed some of the looming problems. In the 1980s many companies (and indeed local councils) took 'contribution holidays' while the going was good. In his 1988 Budget the Conservative Chancellor, Nigel Lawson, stipulated that no fund could accumulate assets whose value was more than 5% in excess of its liabilities (to preserve tax revenues) (Brummer, 2010). As a result, firms reduced their contributions to keep from generating excessive pension fund surpluses (the kind of surplus that is very useful when stock markets turn). A series of pension scandals such as the Maxwell[18] case understandably led the government to impose stricter regulations. By the turn of the century the pressures on DB schemes came to a head.

The dotcom crash of 2000 heaped further pain on pension funds, as liabilities were deepening, and the assets to balance these crashed in value. In 2008 the financial market crashed again. This had a short term negative impact on the value of assets although the stock market quickly bounced back. However, it was the quantitative easing that governments enacted to pull economies out of the recession that was to have a more lasting negative impact on defined benefit pensions. Quantitative easing started in the UK in 2009 putting downward pressure on gilt yields. The consequence of this was to increase the liabilities side of the pension equation. This is because the discount rate used to value the future liabilities of pension funds is based on gilt yields. The National Association of Pension Funds estimated that each 0.1% reduction in gilt yields raised scheme liabilities by 2% (*Quantitative Easing: the pension scheme perspective*, 2011). Quantitative easing consequently increased reported pension deficits, further putting pressure on the sponsoring employer to either pump more money into the fund, or close the scheme entirely.

Transparency of deficits: Finally, as the section above describes, not only were a series of demographic and legislative changes increasing the costs of defined benefit pensions, but these ballooning liabilities were to become all too transparent to shareholders. In 2000, Financial Reporting Standard 17 (FRS 17) required the sponsors of

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[18] To bail out his complex web of companies, Maxwell had raided the pension schemes of his major quoted companies: Mirror Group Newspapers and Maxwell Communications Corporation. Without the approval of Trustees he had borrowed £460 million. This episode raised serious concerns about corporate governance and it was far from the only scandal. See: The National Archives: Mirror Group Newspapers plc. Report by The Honourable Sir Roger John Laugharne Thomas and Raymond Thomas Turner. Accessed at: http://webarchive.nationalarchives.gov.uk/+/http://www.dti.gov.uk/cld/mirrorgroup/summary.htm

pension schemes to report the current market value of assets and liabilities in their financial statements. Previously hidden or fudged pension deficits were suddenly all too clear to see for shareholders. Avrahampour (2008) argues that the discretion that was previously exercised by the pension fund manager in valuing liabilities provided a vital 'valve' that stabilised the system. The removal of this discretion caused the system to break down.

3.3.3 Gender

Finally, it should be noted that poverty in old age has been pre-eminently a problem for women (Hannah, 1986; Thane, 2006b). As Jane Austin put it: "Single women have a dreadful propensity for being poor...which is one very strong argument in favour of matrimony"[19]

In terms of occupational pensions, women have always been particularly poorly served. For large parts of the 20th century marriage was grounds for dismissal, or at least grounds for exclusion from a pension scheme. Schemes which did admit women often repaid their contributions as a 'dowry' on marriage. In private sector employment in 1979, while 50% of men were members of a pension, only 25% of women were. Even in the public sector they were at a disadvantage; while by 1979 nearly 90% of full time employees were members in the public sector, the main excluded group was part time workers, who were of course mainly women (Hannah, 1986). It was only in 1978 that the common practice to explicitly exclude women from pensions was outlawed. And even when they had pensions, employer plans (both DB and DC) were based on tenure and earnings, both of which inevitably fed through into much lower pensions for women.

With reference to state provision, until 1978 married women were permitted to opt out of National Insurance, relying for retirement benefits on their husbands. This reliance on their husbands butted up against demographic realities: women live longer, and tend to marry men who are older than themselves, thus spend longer in widowhood. For example in the US, in 2000, 70% of men over the age of 75 were married, while in contrast close to 70% of women over 75 were divorced, single or widowed (Bajtelsmit, 2006).

Even now, despite many improvements, women are still far more likely to be in poverty than men. As the most recent OECD figures show, older women are at greater risk

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[19] Letter to Fanny Knight, LLXIII March 13 1817, Brabourne Edition

than men of living in poverty in every country where breakdowns are available. In the UK poverty rates for those over 65 are 11.1% for men and 16% for women (OECD, 2017).

Arguably the UKs new flat-rate state pension does little to help this. Designed with the admirable goal of introducing some much needed simplicity, it pays a flat-rate per person pension. So, a couple would currently receive jointly a maximum of £319 a week to live on, but a single person only half this. In practice the single person is more likely to be female. Auto enrolment rules also mean that women are disproportionally less likely to build up an occupational pension than men. Currently you are only auto enrolled into a pension once you earn £10,000 a year. And then contributions are only made on earning between £5,876 and £45,000. This means that part time workers, or those with multiple jobs (again disproportionately women) are likely to lose out under the current system.

3.3.4 Concluding Comments on the History of the UK Pension System

In sum, the history of the UK pension system in the post war period has been one based on fostering voluntary savings. Consequently, in comparison with much of continental Europe, both the individual and the employer have been left much more freedom about the choices they make.

3.4 The Economic Perspective

This section will consider the insights that economics can offer on the question of the level of choice in a pension system. It considers three of the most important strands of economic theory: neoclassical, behavioural and institutional. Blake (2006), writing from a classical perspective, defines pension economics as dealing with the 'allocation of scarce resources over the lifecycle between the time an individual is in work and the time he is in retirement' (p.3). Neoclassical theory has, however, been increasingly challenged by behavioural and institutional perspectives (Mazzoleni & Nelson, 2013). Behavioural economics, which has been hugely influential in pension policy, challenges the highly formal assumptions made by classical economics to reflect a more realistic understanding of human nature. Institutional economics argues that individual action cannot be considered in isolation; that we all operate within a context of laws, norms and customs which hugely influence and constrain our choices. To summarise, economics addresses the question of how we should make choices, behavioural economics of how we do make choices, and institutional economics of how our environment shapes and constrains our choices.

The discussion that follows will pay most attention to the behavioural perspective, as this is where there is most compelling evidence that individuals struggle when it comes to making choices about their pensions. For a full discussion on pension economics (and in particular macroeconomic models[20] which are not covered here) see Blake (2006). This section proceeds as follows: First it considers the contribution that neoclassical economics can make to the debate. Second, it goes on to consider the challenge made by behavioural economics. Finally, it concludes with a section from an institutional perspective.

3.4.1 Neoclassical Economics

Individual decision-making: Neoclassical economics makes the simplifying assumptions that individuals are rational, well informed, selfish, and seek to maximize their utility. The market is assumed to be efficient under the following conditions: perfect competition; complete markets; no market failures and perfect information (Barr, 2004). In sum, it assumes that there is a functioning market, that individuals are able to understand and evaluate the relevant information, and will go on to make an informed decision that reflects their preferences.

An economic analysis of saving decisions rests upon the life cycle model. Developed by Modigliani & Brumberg (1954) it predicts that individuals will smooth their consumption over their lifetime. Essentially, individuals will build up wealth during their working years to guarantee a stable standard of living throughout their life. While the life cycle model provides a theory against which empirical evidence can be judged, and perhaps a normative ideal that many aspire to, critics argue that the evidence suggests that the life cycle hypothesis does not reflect reality very well. Younger people generally do have more borrowing than assets, saving does generally increase with age, and in retirement people do tend to draw upon their assets as they age (O. Mitchell & Utkus, 2004). However, most people suffer marked discontinuities in consumption in retirement (put bluntly: are much poorer in retirement than in their working life) (Legros, 2006).

Corporate decision-making: The history of how employers used pensions as a managerial tool has been discussed in the preceding section. Economic analysis offers a more formalized perspective on the reasons why a firm would choose to pay in the form of

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[20] Blake (2006) notes that macroeconomic policy is not typically used to influence pension decisions which is the primary focus of this thesis.

a pension rather than just with current pay (Blake, 2006). McCarthy (2006) argues that occupational pensions owe their existence either to missing markets, or to imperfections in existing capital or labour markets. To explain, McCarthy cites the seminal paper by Blinder (1983) who showed that where there was no uncertainty, no taxes and perfect capital markets, then pensions would be perfectly substitutable for wages. Given the reality of considerable uncertainty, ample taxes and less than complete capital markets, McCarthy then outlines some of the imperfections that affect pensions from both the perspective of the employer, and the employee.

From the employee's perspective, taxation means pensions are potentially a cheaper way of being paid. Defined benefit pensions, which effectively provide insurance against longevity, investment and inflation, can be a way of exploiting the difference in risk preferences between employee and employer. The (not inconsiderable) transaction costs of providing a pension can make it cheaper for employers to provide pensions than for an individual.

From the employer side, pensions (when employers could restrict vesting) were a way of reducing job turnover. Some have argued that pensions are associated with higher productivity (Dorsey, Cornwell, & Macpherson, 1998). It has also been argued that pensions are an effective sorting device (Ippolito, 1997). Finally, there is widespread evidence that pensions will influence the timing of retirement. These themes are developed more fully in chapter 5 which considers the incentives employers have to provide pensions for their employees.

Welfare economics: efficiency v equity: The third arena of economic thought particularly relevant to pensions is welfare economics. This is the branch of economics that considers issues of social welfare taking into account both efficiency and equity, and is thus informed by normative considerations. Here the central question is that of the appropriate boundary between state command and private activity (Stiglitz, 2000), and this debate is central to the analysis in chapter 4 which looks at the way that three different countries have chosen to draw those boundaries. When considering the argument over the relative advantages of the free market versus state intervention, Barr (2004) and Stiglitz (2000) argue that there are two justifications for why the state might want to intervene: efficiency or fairness. The market may be too imperfect for any outcome to be regarded as efficient or the market will not result in an outcome that we regard as fair. When it comes to pensions, there is good evidence that the state might want to intervene on both grounds.

This thesis, however, primarily considers efficiency arguments for how much choice is desirable.

Intervention on the grounds of efficiency: Barr (2004) argues that where the standard conditions (outlined above) for an efficient market do not hold, the market equilibrium may not be efficient, and state intervention may be justified. When it comes to the market for pensions, arguably the two most obvious problems are that of information and of market failure caused by the problems of insuring against inflation. The foundation of the neoclassical model is perfect information. In order to make a rational choice, actors need information about both the price and quality of a product. Pensions are probably the archetypal example of a market in which poor information is endemic. And this issue of poor information is one that is highlighted in the later experimental studies in chapters 6-8.

Barr argues the other great source of market failure, that implies a role for the state, is inflation proofing of pensions. As he argues, inflation is not a risk (which is calculable) but is an uncertainty (which is not). Further, it is not an independent event; if inflation hits one pension, it hits them all. For this reason, Barr argues that *only* the government can provide protection against inflation, as only the government derives its revenue from tax, which to a certain extent should also rise in line with nominal wages.

Intervention on the grounds of equity: It is perhaps most common for calls for state intervention to be grounded in calls for fairness (although exactly what is meant by fairness is more slippery). The earliest state pensions were often (but not always[21]) introduced to help the poorest, and redistributed from rich to poor. Pensions however, also redistribute from young generations to older generations, from men to women, and within an individual's lifecycle.

Finally, Barr notes that there are many different ways of intervening in a market. For example, the state can regulate a market, can finance a good, can produce the good, and can provide income transfers. In other words, if for equity reasons you wish the state to provide *for* a good, this does not necessarily mean the state should *produce* the good. The pensions market is one in which you can see all of these types of intervention. For example, the pension industry is heavily regulated, the state (through tax contributions)

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[21] For example, pension schemes such as those introduced by Otto Von Bismarck did not help the very poorest.

contributes towards private pension saving, it has set up the National Employment Savings Trust (NEST) and of course, it provides the state pension as an income transfer.

To summarise, welfare economics considers issues of both efficiency and equity. While markets often fail, governments also fail (Stiglitz, 2000). State intervention can be as bad or worse than the initial market failure that justified the intervention in the first place. The challenge is thus to find the best way for both to work together.

Concluding comments on the neo classical economic section: An economic perspective is invaluable for understanding and testing the fundamental principles that underpin the subject. However, one should be very wary of assuming that individuals will make decisions as the rational agents they are assumed, for the point of simplification, to be. This leads us nicely into the following section, which takes a far more realistic perspective on how people, in practice, make choices.

3.4.2 Behavioural Economics

There are many different reasons why people do not save for the future, and the field of behavioural economics has in particular considered this problem from the perspective of decision 'errors' such as lack of knowledge, lack of self-control, procrastination, and status quo bias. In other words, the behavioural economic perspective tends to characterise under saving as a 'mistake' that we should be nudged out of (Thaler & Benartzi, 2004). This perspective is central to any consideration of the issue of how much choice we should have when it comes to our pension. Behavioural economics provides the evidence that we are making 'decision errors' and it also provides potential solutions for correcting these errors as well as the moral justification to do so (Thaler & Sunstein, 2003).

This theoretical perspective has become hugely influential relatively recently. However, its origins can be traced back much earlier, in particular to the early work of Herbert Simon (1995). Simon first introduced the term 'bounded rationality' and 'satisficing'. Bounded rationality points to the fact that many types of decisions and problems are far too complex for the limited processing capacities of the human mind. As a consequence, we become 'satisficers' rather than the optimisers of economic theory. In other words, as we cannot access and process all the necessary information, we seek not the optimal solution, but use heuristics or rules of thumb to achieve a good enough, or satisfactory solution (Tversky & Kahneman, 1974). Mitchell & Utkus (2004) further point to the issues of 'bounded self-control', and 'bounded self-interest' as the other key areas in which behavioural economics has challenged classical economic assumptions.

In brief, in contrast to the well informed, rational, utility maximisers of neo classical economics, behavioural economists have argued that in reality, individual decision-making is subject to: bounded rationality, bounded self-control and bounded self-interest (Blake, 2006). Any policy discussion of how much choice we should have when it comes to our pension needs to be informed by an understanding of how people make decisions in practice.

Lessons of behavioural economics for pension decision-making: Drawing on Blake (2006) and Mitchell & Utkus (2004) the following section discusses the lessons that behavioral economics has for the three main phases of retirement planning (i) the savings decision, (ii) the investment decision, and (iii) decumulation. While this thesis is primarily concerned with (i), the savings decision, this section will outline some of the most relevant research which looks at the full range of choices that the consumer faces. The interested reader should refer to Blake and Mitchell & Utkas for more detail.

(i) The savings decision: Most evidence suggests that few individuals approach planning for retirement in a methodical fashion (Lusardi, 2004). The most obvious explanation for a lack of saving for retirement is the issue of a lack of self-control. The problem of self-control has often been characterized as a struggle between two selves, and this metaphor has been long used to explain our behaviour: from Ulysses and the Sirens (Elster, 1998), to Kahneman's 'system one' and 'system two' (2011). Bazerman et al. (1998) has outlined the history of thought on the 'multiple selves' problem, and argue that it can be fruitfully conceived as a struggle not of two selves, but between what we *want* to do and what we *should* do. Shefrin & Thaler (1988) also suggest a model of two selves: the 'doer' and the 'planner'. The 'doer' is pathologically myopic; while the 'planner' is concerned with maximising a function of lifetime 'doer' utilities. Others have gone beyond metaphor and point to the structure of the brain as a source of this duality. Weber (2004) for example notes that the older limbic brain system is the source of emotional decision-making, and the newer, higher order, cerebral layer, is associated with higher order reasoning.

Frederick et al. (2002) look in detail at the long history of thought on the trade-offs involved when making intertemporal choices. Hyperbolic discounting (Frederick, Loewenstein, & O' Donoghue, 2002) has shown that we can be patient when comparing two long-term alternatives, but considerably less patient when the decision is between now and the future. For example, if offered the choice between one apple in 100 days, or two

apples in 101 days people generally defer. However, if offered the choice of one apple today, or two apples tomorrow (the same time difference), the choice will often shift.

The framing of the savings choice has also been shown to have a large influence on choices (Tversky & Kahneman, 1991). Rational agents would not be expected to change their minds based on how a decision is framed. However, repeated experiments have shown that that is exactly what happens. The most notable example is through making people opt out of a choice rather than opt in. The Madrian and Shea (2001) study is just one of the numerous examples that show that pension participation is significantly increased under auto enrollment.

One of the most powerful drags on pension membership is inertia and procrastination. O'Donoghue & Rabin (2001) note that, sadly, people are likely to procrastinate even more when it comes to important goals than unimportant ones. The more important are one's goals, the more ambitious are one's plans to reach those goals. More ambitious plans require higher effort, and thus the incentive to procrastinate gets worse[22]. Choi et al. (2002) give evidence of the gap between intentions and actions that can result from procrastination and inertia. When employees attended an education seminar on their company pension plan, immediately after the seminar all workers not currently participating in the retirement plan said they intended to join. However, six months later, only 14% of them had actually done so.

All of these common decision errors were used to design one of the most well-known studies in behavioral economics, the "Save More Tomorrow plan". In this research, Thaler & Benartzi (2004) argued that the twin problems of bounded rationality and bounded self-control meant that individuals were saving less for their retirement than they should. Their proposed solution rested on the psychological principles discussed above: Bounded rationality means that plans should be simple. Hyperbolic discounting implies that people will be happier to save more, as long as it is 'tomorrow'. Procrastination and inertia means that auto enrolment should be the default. Loss aversion means that pay increases are a good time to suggest pension increases. Based on these ideas, the "Save More Tomorrow" plan auto enrolled people into savings plans, with the knowledge that they could opt out if they wanted to. In addition, participants were invited to pre-commit to save more with each pay rise. Across three different studies, they found that these two

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[22] They cite Voltaire "The better is the enemy of the Good" (Voltaire in O'Donoghue & Rabin, 2001, p.121).

features increased both participation rates and savings rates. The ideas in this study have been widely adopted. For example, the roll out of auto enrolment in the UK reflects many of these features.

Closely related to the idea of auto enrollment is the idea of active choice. Choi et al. (2005) gave one example where employees were required to select either 'yes' or 'no' when asked if they wanted to join a pension. This increased participation rates by 25 percentage points compared to an opt-in regime. Keller et al. (2011) extend this idea to enhanced active choice, and find positive benefits when individuals are required to make a choice, but the 'preferred alternative' is highlighted. They suggest this is a useful complement to auto enrolment, or can be used when auto enrollment is infeasible or unethical.

Another idea is just to simplify the decision process; again Choi et al. (2005) describe one case where new employees were handed a card during enrollment with a preselected savings rate (2%) and a preselected asset allocation. All employees had to do was tick the yes box. Again, this increased participation rates by 25 percentage points.

(ii) The investment decision: The second key phase of retirement planning is the investment process. In the UK, in contrast to many other pension systems, individuals are given a large amount of choice not only in how much to save, but what to save in. What is the evidence that people make a good job when they pick their own investments? Arguably, the conclusion is that they do not.

The first problem is that too much choice can be off putting. As described by Benartzi & Thaler (2007), Iyengar, Huberman & Jiang (2004) show that increasing the number of investment options in a pension plan reduces the likelihood of employee participation. This agrees with the findings of O'Donoghue & Rabin (2001) who also find that increasing the number of options can induce procrastination. Once that hurdle is overcome, do people invest well? Mitchell & Utkas (2004) argue that there is little evidence that individuals are able to follow the current best practice when it comes to structuring a balanced portfolio. There is scant evidence that individuals understand the relationship between risk and return, how to diversify adequately, and how to shift their assets into less risky assets as the time to retire approaches. Again, the framing of the choice is hugely influential in shaping investment decisions. Benartzi & Thaler (2007)

give multiple examples that show the disproportionate (and counterproductive) impact that the plan menu can have on choices[23].

Inertia and procrastination is just as evident in the investment decision as it was in the savings decision in the first place. Mitchell & Utkus (2004), using data from Vanguard, show how fewer than 10% of plan participants change their asset allocation each year. More tellingly, individuals who enrolled in plans in years when the stock market was booming set their allocation to equities high, and left them high. In contrast, those who invested when the market was in a downturn set their allocations to equities much lower, and again did not adjust them. Whatever the rights and wrongs of either strategy, it demonstrates remarkable inertia.

The example of the Swedish pension system provides an illustration of the unintended costs of encouraging investment choice. As described in more detail in the following chapter, when Sweden redesigned their pension system, they introduced private accounts for each individual. While there was a default fund choice, which had very low charges of 16 basis points (0.16%), individuals were encouraged to make their own selection from a very wide range of funds. Most did so, and most chose funds with much higher charges (an average of 77 basis points), higher risk, and with a strong home bias. These far more expensive funds subsequently underperformed the default fund, and the Swedish Government no longer encourages active choice in funds (Cronqvist & Thaler, 2004).

(iii) *The decumulation phase:* Perhaps the hardest decision of all is when and how to draw down one's savings. While Yari's (1965) widely cited paper demonstrated that rational individuals (under very strict assumptions) *should* want to convert *all* their wealth into an annuity, in practice this has not been a popular option. Davidoff et al. (2005), in an attempt to understand the annuity puzzle (if annuitisation is so rational how come next to no one chooses to annuitise?), relaxes some of the strict assumptions made by Yari. They show that if, for example, markets are incomplete, while full annuitisation is no longer rational, partial annuitisation should still maximise consumer's utility. They suggest that

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[23] For example, in one experiment by Benartzi & Thaler (1999), participants were presented with two alternative retirement income choices, both using historic bond and equity data. They showed individuals either one-year returns with a probability distribution of outcomes, or thirty-year returns. Those who saw the one-year returns allocated far less to equities than those who saw the long run returns.

behavioural considerations might explain the mismatch between observed demand for annuities and their theoretical value. Benartzi et al. (2011) also note that (for those with non-negligible assets) there is as much a problem of spending too little, than too much. They argue that a lack of annuitisation is explained by the usual behavioural suspects of framing, loss aversion and risk perception. Mitchell and Utkis (2004) note that the three key risks that individuals face in the decumulation phase are: longevity risk, inflation risk and capital market risk. They suggest there is considerable evidence that consumers fail to understand the implications of all three.

Weaknesses of the behavioural economic perspective: While behavioural economics has undeniably led to a much more sophisticated understanding of how people actually make choices, it has also come in for some criticism. One criticism of behavioural economics is that, like neo classical economics, it overly focusses on the individual actor. The spotlight is thus placed on individual myopia and not on institutional myopia. Consequently, behavioural economics is likely to be an attractive intellectual perspective to those who lean towards free choice in political terms.

A second problem, of particular relevance to pensions, is that while defaults are effective, they are often set deliberately low. As noted by Choi et al. (2009) this can be a drawback as it may lead to lower saving; people who would have voluntarily elected to save might have chosen to save at a higher rate than that set by auto enrolment had the decision been unprompted.

Further, John et al. (1970) argue that, nudges, while effective, do not seek to change values, and there may be situations where it is important that people are really made aware of the reality of the choices they face (for example when choosing their job – the focus of chapters 6 and 8). In sum, one of the key weaknesses of a behavioural economics' perspective is its lack of attention to the wider context in which decisions are being made. Consequently, the next section goes on to consider the literature on an institutional perspective.

3.4.3 Institutional Economics

New Institutional Economics, associated with North, Coase and Williamson, is a broad research area that emerged in the 1980s. North's canonical definition is of institutions as "rules of the game" (1991), the constraints we devise in order to structure our political, economic and social interaction. These constraints are both formal and informal. Formal rules are the laws, constitutions or property rights. Informal rules are social norms,

conventions and self-imposed codes that govern individual behaviour and structure social interaction. Williamson (2000) outlines the main areas that New Institutional Economics has focused on.

If individuals are unable to make good decisions (they are boundedly rational), or unable to shield themselves from adverse risks through individual provision (for example inflation shocks) then Schmid (2006) argues that the state should step in by designing institutions that enable some degree of risk sharing. Esping-Anderson (1990) traces the causal forces behind the development of the welfare state and centres on the question of what is the optimal division of responsibility between the market and the state (the focus of chapter 4). As Esping-Anderson notes, Titmuss (1958) made the classic distinction between residual and institutional welfare states. In residual welfare states, the state limits itself to providing only when the market or family has failed, and so is restricted to marginal groups. In institutional welfare states, the state extends its services much more broadly and engenders a widespread commitment to welfare. Esping-Anderson considers the welfare state from three lenses: First, the extent to which it decommodifies the status of individual vis a vis the market (i.e. the extent to which the individual is free from reliance on the market). Second, social stratification (the extent to which the welfare state acts as a system of social stratification). Third the interaction between the market, the family and the state. It is the first two which are most pertinent to the discussion in this thesis. The design of the UK pension system has always been to keep benefits low, so as to maintain work effort, and to this extent is a classic example of a benefit designed to increase the 'commodification' of labour. Regarding stratification, Esping-Anderson argues that with increasing wealth there was a choice of whether the state or the market would be used to furnish adequacy (rather than just poverty relief) and so provide for middle class aspirations. In the UK, for example, the choice was to preserve a low universal state benefit, and encourage the market to provide for the aspirations of the middle class. The effect is that one of the fastest growing expenses for the state is tax subsidies for private pensions. In contrast, in other countries such as Sweden and Norway, the state included the middle class, which preserves broad support for the welfare state.

In sum, an institutional perspective argues that the actions of individuals cannot be understood without understanding the influence of political, cultural and social constraints.

3.5 The Philosophy of Choice

Ultimately, the question of how a state best balances state intervention with individual freedom to choose (i.e. what is the *'right'* level of choice in a pension system) rests on a normative judgement. This calls for a discussion on the history of thought on what balance between freedom and constraint is desirable. One's perspective on how a society should draw the boundary between individual freedom and state intervention often informs an unspoken subtext to the debate on pension policy. For example, the UK's current policy of a flat-rate state pension, calculated to be just enough to lift people out of poverty, was designed to provide "a firm foundation for [private] saving" (Department for Work & Pensions, 2013). This policy explicitly referenced Beveridge's original vision for the welfare state (which included idleness as one of the five great evils to be fought), and implicitly supports a philosophy of choice which sees a minimal role for the state.

Barr (2004) distinguishes between three different types of theory through which to analyse and choose between different social arrangements: libertarian, liberal, and collectivist. The libertarian position can be further divided. Natural rights libertarians, such as Nozick (1974), argue liberty is sacrosanct, and state intervention is morally wrong except in very strict circumstances. Empirical libertarians such as Friedman (1990) and Hayek (1945) argue from instrumental grounds: it is not that state intervention is morally wrong, rather that it will reduce total welfare. Liberal theories, such as those put forward by Rawls (1973), place a higher priority on fairness and see income redistribution as an appropriate function of the state. Collectivist arguments, such as those of Marx, form the other end of the spectrum, and here private property has a very limited role.

This section provides a very brief overview of some of the key texts in this debate. An obvious place to start is with Mill, as his is the first grand defence of individual liberty[24]. It then turns to more modern libertarians. Nozick, who argues from a natural rights perspective, and Hayek and Friedman who represent the empirical libertarian position. Next it considers the other end of the political spectrum with Rawls. Finally, it notes Isaiah Berlin's classic distinction between positive and negative liberty as a way of, if not reconciling, at least understanding the different positions taken.

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[24] Berlin (1969) notes that Mill's doctrine is comparatively modern – that there is very little discussion of individual liberty as a conscious political ideal in the ancient world.

Mill

In *On Liberty* Mill argues that we should strictly limit the extent to which the state can exercise power over the individual (Wolff, 2006). While Mill rejects an extreme defence of individual liberty (life would be unliveable without some constraints[25]), he nevertheless seeks to find some way of defining on what grounds we should allow the state to interfere, aside from arbitrary custom or popular morality. His 'Harm Principle' famously argues that you may only justifiably limit another person's freedom if they threaten harm to others[26]. This principle explicitly rules out permission to interfere with another on the paternalistic grounds that it is for their own good. This is an attractively simple formulation, but in practice can be hard to define. Ultimately Mill suggests the line is to be drawn so that people have a private sphere of interests where no intervention is allowed, and a public sphere, where the state can intervene, but only on the utilitarian grounds of what will serve the interests of general happiness (Wolff, 2006). Mill favoured laissez-faire capitalism, so while he argued that we needed to be protected from theft of property, one had no rights to be protected from the vicissitudes of a normal market economy. In effect Mill defends (negative) liberty on instrumental grounds, and his defence of this rests heavily on his belief that individuals are capable of learning and progress.

Nozick

Skipping several centuries forward, and turning to the specific question of property rights, Rawls and Nozick represent the two most important figures in twentieth century political philosophy. In *Anarchy, State, and Utopia*, Nozick (1974) takes Mill's defence of liberty and develops a robust libertarian argument against state redistribution. He argues that our natural rights to property are such that the state has (almost) no justification to interfere with them. For Nozick, taxation is on a par with forced labour: the state has (except in highly limited circumstances[27]) no right to forced takings of property (i.e. through taxation)

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[25] 'All that makes existence valuable to any one depends on the enforcement of restraints upon the actions of other people' (Mill, 1859 in Wolff, 2006 p 105.)

[26] Mill explicitly argues that this principle is only meant to apply to people 'in the maturity of their faculties' (On liberty, 135) Children and 'barbarians' are excluded – the principle 'has no application to any state of things anterior to the time when mankind have become capable of being improved through free and equal discussion' (On Liberty 136). In other words Mill argues that Liberty is only valuable under certain conditions, and if those conditions do not apply then it can do a great deal of harm (Wolff, 2006 p.106).

[27] Nozick argued that our right to individual liberty is such that the only right the state has to intervene is in the protection of persons and their private property. Taxation is thus only allowable in order to fund a

nor does it have any right to intrude on paternalistic grounds. Nozick's theory of property rights is based on three principles: 'justice in initial acquisition' 'justice in transfer' and 'justice in rectification'. Briefly: justice in acquisition sets out how we may first acquire property in a just manner, that so long as property was unowned, or not acquired through fraud, coercion or theft, it is just[28]. Likewise, a transfer is just as long as it is not done through fraud, coercion or theft. The third principle, justice in rectification, works to rectify any violation of the two first principles.

Empirical Libertarians

Nozick's theory of justice is based on a moral defence of our individual rights. An alternative is a utilitarian justification of property rights (implicit in Mill's view). This would argue that property rights and free trade lead to a richer economy than any other alternative, consequently human happiness is best served by ignoring the problem of how those property rights were initially acquired. From this perspective, the issue of justice in transfer takes precedence over the principle of justice in initial acquisition. This perspective is perhaps best argued by Hayek (1945) and Milton Friedman (1990) and was adopted as the guiding principle of the Thatcher and Reagan governments. Hayek, who passionately defended market economies, argued that they are far better able to produce and distribute what the consumer wants compared to a planned economy. Hayek bases his argument on empirical grounds. The price system is a way of signalling and transmitting

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judiciary, a police force and an army. Taxation that is used to pay for all other functions of the state such as education, healthcare and poverty relief is unjustifiable.

[28] Nozick's first principle, justice in initial acquisition, returns to the question that Locke addressed (somewhat inadequately) in his Second Treatise in 1689: how does one justify the initial acquisition of property. Put somewhat simplistically Locke argued that once you mix your labour with some object you come to own the object on which you have laboured. Wolff (2006) outlines Locke's, not entirely persuasive, argument from his Second Treatise (1689). Locke's first argument is that we must be allowed to take things from nature otherwise we would not survive (this is his 'fundamental law of nature'). However, we must not take more than we can make good use of (the non-wastage proviso), and we must leave 'enough and as good' for others. Next Locke introduces his 'labour mixing argument'. This starts from the premise that you own your own labour, and that once you mix your own labour with some object, you come to own the object on which you have laboured. Locke further appeals to the idea of value added, that as our labour is what gives objects their productivity (a cultivated plot is 100 times more productive than an uncultivated plot), that one's labour again entitles the labourer to appropriate the land. Locke's fourth argument appeals to industriousness. If someone works hard to cultivate and improve the land they surely have more right to it than the lazy complainer. All these arguments, as Wolff points out, are inadequate in many respects, yet very little progress has been made in improving on these arguments of Locke.

information, and the profit motive gives people a reason to respond to that information. In the planned economy, how will the planner know preferences, and why should the planner take the trouble to make sure I get what I want. In other words, it is not that most state intervention is wrong in principle (Nozick's position) rather that it will reduce total welfare.

Rawls

The opposing view to Nozick's extreme defence of (negative) liberty is most famously outlined by Rawls (1973). Rawls, a contemporary of Nozick, generalizes the traditional theory of the social contract as represented by Locke, Rousseau and Kant. He asks what principles of justice we would agree upon if made from behind 'veil of ignorance'. Rawls argues that we are often blind to what principles of justice should look like, as we cannot help but be biased by our own particular interests. We know what cards have been dealt to us, we know if we are rich or poor, weak or strong, healthy or frail, and so find impartiality difficult. The veil of ignorance is thus a methodological device to help us uncover a set of principles for a just society that we would all rationally agree to.

The first element of Rawl's hypothetical contract argument is what he calls 'the original position'. Here people do not know what their circumstances would be, what gender or class they would belong to. Rawls further supposes that in this original position people are not even aware of their values, or their different 'conceptions of the good', they would not know their moral religious or philosophical views. From this position, Rawls argues that people would agree to the 'Liberty Principle' that everyone should have an equal and extensive set of basic liberties. This seems like a rational choice, if you do not know in advance what group you might belong to. An obvious objection is that we might, from the 'original position' agree to some degree of inequality in liberty if it would make everyone better off. Another objection is without some 'conception of the good' how would you even know that liberty is something to be valued. To this latter objection, Rawls suggests that people in the original position should have a 'thin theory of the good', a basic understanding of the primary goods: liberties, opportunities, wealth and income, that we should all rationally want.

Once he constructs this device of the original position, Rawls argues that we would, rationally, and to further our own self-interest, go on to choose two central principles:
(i) That each person is to have an equal right to the most extensive system of equal basic liberties compatible with a similar system of liberty for all (the Liberty Principle).

(ii) Social and economic inequalities are to be arranged so that they are both: (a) to the greatest benefit to the least advantaged (the Difference Principle) and (b) attached to offices and positions open to all under condition of fair equality of opportunity (the Fair Opportunity Principle) (Rawls, 1973 p.302).

The difference principle is where Rawls addresses the objection that complete equality destroys an incentive for people to work hard. Here Rawls argues that the distribution of wealth should be equal, unless an inequality would be to everyone's advantage, and in particular to the advantage of the least well off in society. In other words, Rawls' contention is that we should choose the principles of society so that the condition of the least advantaged is given priority (rather than a society, for example, in which the rules result in the highest average outcome)[29]. The basic intuition behind Rawl's theory is that since everyone's wellbeing depends upon a scheme of cooperation without which no one could have a satisfactory life, then the division of advantages should be such as to draw forth the willing cooperation of everyone taking part.

Nozick would critique Rawls by pointing out that his two principles (the Liberty principle and the Difference Principle) are inconsistent. For Nozick, individual liberty means that the state has almost no basis on which to restrict our right to hold property in a market based on free and fair exchange. In other words, to respect Rawls' difference principle entails violating his Liberty principle. In addition, Nozick notes that while modern democracies might use the rhetoric of redistribution from the rich to the poor, in practice the logic of the ballot box means that redistribution is normally largely from the rich to the middle-income groups.

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[29] Wolff (p.160 – 163) unpicks the logic behind Rawls choice to prioritise the outcomes for the least advantaged. He points out that choosing principles of justice is a problem of rational choice under uncertainty. He outlines three potential choice rules: maximisation of expected utility, maximin, where you choose the option that offers the least bad downside, or maximax, where you would choose the outcome with the best upside. Wolff points out that in the straight comparison with social rules based on expected value or maximax, certainly the safer rational choice – as Rawls argues – would be maximin. However, Wolf suggests that 'constrained maximisation; might be better than both. This principle would say we should choose our social principles based on expected value (what system would be likely to lead to the highest average score) but exclude any option that would contain a very bad possibility. This is in essence maximise expected value but with a safety net, and under this criteria we might be prepared to accept a high level of inequality as long as no one is left in too much poverty. In other words a western society with a welfare state. Rawls thinks constrained maximisation fails as it would be too hard from the original position to have set the social minimum.

Berlin and the "Shifting Frontier"

One way of, if not reconciling, but at least understanding the different positions taken by Rawls and Nozick is through Berlin's (1969) distinction between two types of liberty: negative and positive. Negative liberty is the absence of constraints or the freedom to be prevented by others from doing what one wants (i.e. Nozick's understanding of liberty). Positive liberty, in contrast, is the possibility of acting, the active ability to take control of one's life and realise one's fundamental purpose.

Berlin was alive to the dangers of both positive and negative liberty: under negative liberty, "Freedom for the pike is death for the minnows" (p.124). However, positive liberty can also be used as a "cloak for despotism in the name of a wider freedom" (p.xiv). What he is most concerned to establish is that, while they are both desirable goals, they are different goals, and that they may clash: "where ultimate values are irreconcilable, clear-cut solutions cannot, in principle, be found" (p.l). It follows, in his words, that "a frontier must be drawn between the area of private life and that of public authority. Where it is to be drawn is a matter of argument, indeed of haggling" (Berlin, 1969 p.124).

In sum, one's understanding of the extent to which we should be free to choose when it comes to our pension, or whether the state should compel us to save (for ourselves or others) is a function of one's beliefs over where this frontier should be drawn between positive and negative liberty. For Rawls and Nozick there is little or no discussion. However, for empirical libertarians who sit in confusion in the middle, the debate is informed not by moral absolutes, but on the evidence of the relative costs and benefits of alternative solutions, and is a matter for haggling not comfortable certainties.

3.6 Conclusion of Literature Review

The history of the UK pension system has been one of minimal state provision, designed to encourage voluntary saving. While Governments have occasionally been tempted by offering pensions that have a greater link with earnings, this has always been scaled back as fears of costs grew. Consequently, in comparison to much of continental Europe, private occupational pensions play a much larger role in providing retirement income. This means that both the individual (and their employer) have considerable freedom about the choices they make. While a neo classical perspective assumes that the rational consumer will respond to this choice by smoothing their consumption over their lifetime, the evidence suggests we do not. The behavioural economics literature demonstrates the systematic ways in which we fail to make rational decisions about our pensions, and has

come up with well-designed nudges to improve individual decision-making. An alternative way to improve outcomes is through institutional solutions that constrain choice. Ultimately the answer to how much choice we should be allowed rests on a normative judgement about the proper balance between positive and negative liberty. Where this frontier should be drawn is a matter of haggling, and should be informed by evidence on the costs and benefits of free choice.

Consequently, this thesis asks the question of how much choice citizens should have when it comes to their pension. It considers this problem from three perspectives: (i) that of the state (ii) that of the employer and (iii) that of the individual.

4 The Impossibility Triangle and the Logic of Choice

> *"The state in organising security should not stifle incentive, opportunity, responsibility; in establishing a national minimum, it should leave room and encouragement for voluntary action by each individual to provide more than that minimum for himself and his family."* (Beveridge, 1942 p.7) .

> *"The tax rules around these pensions are a manifestation of a patronising view that pensioners cannot be trusted with their own pension pots. I reject that. People who have worked hard and saved hard all their lives, and done the right thing, should be trusted with their own finances, and that is precisely what we will now do: trust the people." (George Osborne, The Budget 2014, House of Commons Library, p.30)*

4.1 Introduction

This chapter is a comparative analysis of three different pension systems. The aim of this chapter is threefold. First, by using the example of the UK, Australia, and Sweden, to illustrate the very different ways in which the issue of choice has been approached in designing a pension system. The second primary objective is to make the argument that a pension system that prioritises free choice is more expensive than it might first appear. Finally, it seeks to highlight some of the interdependencies that exist in any pension regime.

When discussing the 'ideal' level of choice in a pension system (what should be left to the state and what to the market) the first thing to do is to point out just how many choices there are. For example, can you choose to save or not in an occupational pension? Is your employer obliged to make pension contributions on your behalf? Can you choose your investments (or the fees you are charged for those investments)? Can you choose to access your money early? Can you choose to be invested or not in your own firm's

shares[30]? In the decumulation phase, how and when can you choose to access your money? Is annuitisation compulsory or voluntary? Is it compulsory or voluntary for employers to index link pensions in payment? What role is played by the welfare system, and will the state bail you out if you make bad choices? In other words, how much choice we should be allowed in saving for retirement, is not a straightforward question. Some of these choices might be evaluated in relative isolation, others very much must be seen as part of a system.

All pension systems have similar objectives: to prevent poverty in retirement, to provide a mechanism for income smoothing, and to provide some level of insurance (Barr, 2004). However, even among the richest countries, there is remarkable diversity in how these objectives are approached. At heart these differences revolve around the central question as to what is the optimal division of responsibility between market and state (Esping-Andersen, 1990). The UK, in common with other liberal market regimes, has placed the market at the heart of pension provision, while in contrast continental pension systems accord the state a far larger role.

This chapter is organised as follows: It starts with a brief review of the literature on the development of different welfare states which draws upon the idea of institutional complementarity. It then sets out a theoretical model of choice. Here it argues that there is a choice between two fundamentally coherent sets of policy choices for the state. If occupational pension saving is compulsory, then the state does not need to provide strong incentives to save. In contrast, if occupational pension saving is voluntary, then the state needs to design a system which incentivises saving, and pay careful attention to how different elements of the pension system reinforce or undermine each other. Finally, the model is illustrated through three case studies of different pension systems: Australia, the UK, and Sweden. The UK and Sweden are chosen as archetypes of liberal market economies (LMEs) and coordinated market economies (CMEs) respectively (Hall & Soskice, 2001), where the state and the market play very different roles in ensuring retirement income. Drawing on Yin (2013) these countries were selected as they represent diametrically opposed cases, which illustrate the logic of the model. In addition, the UK provides an example of an LME in which the pension system has moved from a highly

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[30] This was a dangerous choice for Enron employees, many of whom who lost their job and their pension fund at the same time (J. J. Choi, Laibson, & Madrian, 2005).

incoherent set of policies to one which, while still prioritising choice, exhibits far more internal coherence. Australia is chosen to illustrate an alternative example of incoherence.

4.2 Theoretical Foundation

Esping-Anderson (1990) outlines the historical development of different welfare regimes, dividing them into three clusters: the 'liberal' welfare state in which the state encourages the market, either passively by guaranteeing only a minimum floor, or actively by publicly subsidising (for example through tax relief) private provision of welfare. The second cluster was that of the 'corporativist' regime, which rejected market provision of welfare but still maintained a strong commitment to the preservation of traditional family patterns and family responsibility (countries like Austria, France and Germany). Finally, a third cluster represented 'social democratic' regime types such as Sweden and Norway, which placed far less emphasis on the family's role. The core difference between these clusters is over the division of responsibility between market and state. As Esping-Andersen (1990) points out, for Adam Smith the market was the superior mechanism to abolish inequality and privilege; state intervention stifled the equalising process of competitive exchange. The counter argument was that a strong state, by reducing workers dependence on the market ('decommodification'), would increase the power of the working class to demand equality.

This chapter also draws upon the concept of institutional complementarities. The varieties of capitalism perspective (Hall & Soskice, 2001), which presents a simpler typology of liberal market economies (LMEs) versus coordinated market economies (CMEs), makes explicit use of the idea of institutional complementarities. In general, complementarity refers to a system in which two or more elements must be combined to produce a particular outcome (Höpner, 2005). Economists have used the concept to argue that individual elements of strategy cannot be evaluated in isolation, but that they may only increase output if they are in certain combinations (Milgrom & Roberts, 1995). As Amable et al. (2005) put it, institutional complementarity is present when the presence or particular form of one institution in one area, reinforces the functioning or efficiency of another institution in another area. The definition of pension coherence used in this chapter is derived from this definition: different parts of a pension system are coherent when the presence or particular form of one part of the system reinforces the functioning or efficiency of another part, in another area. In short, governments should not play 'institutional Lego' (Höpner, 2005 p.334). For example, one can see the recent reforms of

the UK pension system in pursuit of the "freedom and choice agenda" (Osborne, 2014) as designed to create a coherent system in which primacy is given to providing "a firm foundation for [private] saving" (Department for Work & Pensions, 2013 p.5)

The discussion on institutional complementarities has in particular looked at the domains of industrial relations and corporate governance and financing, and in this chapter its logic will be extended towards building a theory of two equal, but coherent, sets of pension policy options. The aim here is not to link the presence of one type of pension system with other aspects of the wider economy, but rather to look at the internal logic of different elements of a pension system. As Barr & Diamond (2009) have argued, pensions have multiple objectives, and considering one in isolation, particularly implicitly, leads to flawed analysis.

If the logic of institutional complementarities seems intuitively appealing, the problem nevertheless remains of how to measure it. Amable et al (2005) argue that one can conceive of two different conceptualisations of institutional complementarity. One measure is through a comparison of output or performance. An alternative way of conceptualising institutional complementarity is related not so much to a comparison of performance, but rather that certain combinations are regarded as stable. For example, in the context of a pension system, weak incentives and compulsory saving are complementary if the presence of one implies the presence of the other. Applying the logic of complementarities to the pension system, it is argued that the different elements or pillars of the pension system that are designed to further the different objectives of the pension policy (poverty relief, consumption smoothing, and insurance) need to be evaluated as a whole, and that this is a particular design issue in a voluntary market based system.

4.3 The Logic of Choice and the Impossibility Triangle

Bozio et al. (2010) argue that there is an enduring dilemma at the heart of pension policy which they refer to as the 'impossibility' triangle. They argue that (in the absence of compulsion) it is not possible to have a policy that (i) removes income poverty, (ii) without disincentives, and (iii) at a low cost. Only two out of those three objectives are possible at the same time. For example, if you want to encourage people to save, you need to offer tax incentives to persuade them to lock away their money. It is also desirable to have a universal flat-rate state pension (people can be reluctant to save if they know the state will bail them out). Both of these can be very expensive for the state: tax relief on pension

saving results in huge forgone tax revenue; and means-testing can prevent poverty at a far lower cost (as money can be targeted at those who most need it)[31]. Beveridge was well aware of this latter tension, and regarded means testing 'as morally and functionally pernicious' (Harris, 2006 p.29). On the assumption that the removal of income poverty is a priority, this leaves the state with a choice: either they have to spend money on developing a system that incentivises private saving, or they have to force people to save.

To reduce the design of a pension system down to its simplest level, the choice can be thought of as some combination of weak/ strong incentives and voluntary/compulsory occupational pension saving. While there are four possible policy combinations, the logic of the 'impossibility' triangle implies that only two of them are coherent: (i) a combination of compulsory retirement saving in which the state offers weak incentives to private saving, or (ii) a combination of voluntary saving in which the state then offers strong, incentives to save. If the state chooses the second option, a system which prioritises free choice, there are four main levers which they can use to incentivise saving (discussed below) and these also need to be combined coherently. Coherence is defined by reference to Hopner's (2005) definition of institutional complementarity: a pension system is coherent if the form taken by one particular institution reinforces the effectiveness in another area. Sweden is chosen as an example that illustrates the (coherent) combination of weak incentives to save, with compulsory pension saving. The UK is chosen as an example of a pension system that has, after considerable redesign, shifted to a combination of voluntary saving combined with strong incentives to save. Finally, Australia is chosen as an example to illustrate a pension system with some incoherent elements. While occupational pension saving in Australia is compulsory, the tax incentives for pension saving are arguably over generous.

4.4 Incentives to Save: The Four Levers

As Barr notes, there are three main objectives of a pension system: to prevent poverty in retirement, to provide some level of insurance and to provide a mechanism for income smoothing (Barr, 2004). The way in which governments pursue these objectives through setting the rules on (i) means-testing (which targets poverty), (ii) annuitisation (which

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[31] As Bozio et al. (2010) note, if the increased costs of having a flat-rate pension system have to be met by raising taxes elsewhere, this will result in distorted incentives elsewhere in the economy.

allows for insurance), and (iii) the generosity of the tax incentives (which allows for income smoothing), has a profound impact on the incentives to save privately. Consequently, the discussion that follows considers how Sweden, the UK and Australia have used these different levers. In addition, the discussion also considers a fourth issue: (iv) the clarity and credibility of a system. While more amorphous, this nevertheless remains an important aspect that can support or undermine a pension system. These four different elements of a pension system are first outlined below, before going on to discuss how the UK, Australia and Sweden have used them.

4.4.1 Means-Testing

The reduction of poverty in retirement is often achieved through means-testing state retirement benefits. Those who have not saved adequately, whether due to imprudence or lifetime poverty, are given more state support. However, means testing can be a profound disincentive for those on average and lower incomes to save. As noted earlier Beveridge was profoundly averse to means testing which he felt eroded the incentive for private saving. Crucially, while means testing is a cost effective way for governments to target money at those most in need, it can create adverse incentives (to save). As the Turner report (2004) made clear, a flat-rate pension, set at a high enough level to avoid means testing, "would require an immediate and significant increase in public expenditure. Much of the benefit of this would flow to better-off pensioners who are already well provided for by historical standards. Younger workers would have to pay higher taxes to finance this at the same time as having to save more for their own retirement" (p.9). As the 'impossibility' triangle suggests, if you want to retain incentives to save, *and* you want to keep people out of poverty, it comes at a cost.

4.4.2 Annuitisation

Annuitisation, where a fixed lump sum is exchanged for a regular income that will last you the rest of your life, is a method to insure against the risk of outliving one's wealth. While some degree of annuitisation is arguably rational economically (Davidoff et al., 2005; Yari, 1965), they have often felt like very bad value to those who were forced to buy one. See Poterba (2006) and Martin and FitzGerald (2006) for two competing perspectives. Whatever the truth as to the level of value they offered to the buyer, there is little dispute that they were profoundly unpopular in the UK (Gardner & Wadsworth, 2004) and were seen as a disincentive to save in a pension. In sum, while (at least some degree of)

annuitisation is regarded as optimal from an economic perspective, it is profoundly unpopular. Where pension saving is compulsory, the state is free to insist that savings are annuitised without worrying about any disincentive effects.

4.4.3 Tax Incentives

Diamond (2009) argues that, while normative theory on the taxation of savings is not settled, a system of deferred taxation is logical. While tax deferral reduces people's ability to pay taxes, it encourages citizens to provide for their old age. There are three obvious points where pension saving can be taxed: First, when contributions are made; second, on the investment returns of the fund; and third, when funds are withdrawn. At each stage, the assets can be described as being either: fully taxed at marginal rates of personal income tax (T); taxed more lightly than marginal rates (t); or exempt from tax (E). The most common form of tax treatment in private pensions in industrialized countries is to follow a regime known as EET (Exempt, Exempt, Taxed). Here tax relief is given on contributions to pensions, there is no tax on returns as they accrue in the growth stage, and when income is withdrawn it is subject to tax at the personal level. In essence, an EET system allows for tax-rate smoothing over one's lifetime. One implication is that those individuals who are higher rate tax payers during their working life, but basic rate taxpayers in retirement, will face a stronger incentive to save. In contrast, under a pure EET system, for those who are basic rate taxpayers in both periods the tax advantages to pension saving (as opposed to saving in a more liquid form) are less obvious. While the generosity of tax relief on pension saving is a hotly debated issue, a system which relies on free choice arguably needs to need to offer far more generous tax incentives to encourage people to defer their spending. Given evidence of: bounded rationality; bounded self-control; credit constraints; and uncertainty about the future; it is understandable that many will only voluntarily lock away their money if offered sizable (tax) incentives to do so.

4.4.4 Clarity and Credibility

In a pension system based on freedom and choice, the issue of clarity and credibility is central. With regard to clarity, we are creatures of bounded rationality (Simon, 1995). Whatever the economic realities of the benefits to saving, we cannot be motivated by a system that is too complex to understand. With regard to credibility, the pension contract is unusually long. An individual aged twenty who decides to save today, is making a decision that will not fully play out for another sixty to eighty years. You are not only

trusting the current government, but all future governments, not to fundamentally change the nature of the deal.

There now follows a discussion of how three different countries, Sweden, Australia and the UK, have managed these tensions. While all three countries are generally regarded to have reasonably good pension systems (Mercer, 2017), they have evolved in very different directions. To repeat, there are three principal objectives in a pension system: poverty relief, consumption smoothing, and insurance. This next section considers the extent to which the institutional structures that address these different objectives form the basis for a consistent and integrated retirement system or make for an incoherent and dysfunctional whole. Each section proceeds as follows, first an outline of the pension system is described. Next the levers of (i) means-testing, (ii) annuitisation, (iii) tax incentives and (iv) clarity and credibility of the system are discussed in turn. There follows a general discussion comparing the three systems, in particular pointing to the cost implications of a model that prioritises fee choice. Finally, the limitations are discussed before the concluding comments.

4.5 The UK

In the UK, until recently, occupational pension saving was entirely voluntary, the state pension system was labyrinthine in its complexity (see OECD, 2015 for a review) but, as a whole, the incentives to save for those on median and low incomes were arguably weak. While the cost to the Treasury of the tax incentives to save have been enormous - £38 billion in 2011-2012 (Institute for Fiscal Studies, 2014) - they have largely been taken up by those on the highest incomes. For those on lower incomes the tax incentive to save was far more neutral. Perhaps more salient in the mind of those who were choosing whether or not to save was the fact that, for many, the means testing of the state pension was in effect an indirect tax on saving. Finally, until 2014, annuitisation was effectively compulsory, which was again perceived as a disincentive to save[32]. The different elements of the system made sense when considered individually, annuitisation is arguably optimal, means-testing is an efficient way to target incentives to those most in need while minimising the cost to the Treasury, the system of tax incentives was designed to allow

[32] Again, this was an issue more pertinent for the middle of the income spectrum. Very small retirement pots could be taken as cash, and those who could show they had regular retirement income in excess of £20,000 were also not obliged to annuitise.

workers to smooth their income over their lifetime. However, taken as a whole, they added up to an unattractive package.

By the turn of the 20th century it was clear to all that there was a problem in pension coverage in the private sector. In 2002 a Pensions Commission[33] was set up to review the UK private pension system. The recommendations of the three reports resulted in a considerable redesign of the UK pension system. In 2013 the government announced the introduction of a single-tier flat-rate pension that was set above the basic levels of means tested benefits. The stated aim was to keep people out of poverty and provide a 'firm foundation for private saving' (Department for Work & Pensions, 2013). Auto enrolment, a form of soft compulsion, was also introduced in order to encourage far wider private saving. Finally, in 2014 the obligation to buy an annuity with your retirement savings was removed. The UK now had a system in which private occupational saving should be considerably more attractive to the individual. The tax incentives (despite some scaling back for the wealthiest) continue to be most attractive to those on higher incomes.

4.5.1 An Outline of the New UK Pension System

There are four main pillars to the UK pension system:

Pillar one: in 2016 a new single-tier pension replaced the previous basic state pension and additional state pension[34] with a flat-rate pension, set above the basic level of means-tested support, for people who reach State Pension age on or after 6 April 2016. In 2018 the (full) new State Pension is £159.55 per week.

Pillar two: auto enrolment: all employers are now obliged to enrol employees into a pension scheme and make contributions on banded earnings[35] on their behalf. The employee must also make minimum contributions. By 2019 the contributions will

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[33] The Commission was announced in the 2002 Pensions Green paper. It was made up of three commissioners: Aidan Turner (the chair), John Hills and Jeanie Drake. The first report was published in 2004, the second in 2005 and a final statement in 2006. The three reports are referred to collectively as the Turner Report.

[34] Under the old system the first pillar of the state pension was made up of four main components: the basic state pension (BSP), earnings related benefits, flat-rate non-contributory benefits and means tested benefits.

[35] There is an earnings trigger which determines how much you have to earn before you get automatically enrolled. Currently it is £10,000 per annum. Once enrolled employers are only obliged to pay pension contributions on banded earnings (in other words pension contributions are not made on every pound earned). The upper and lower bands for 2016/17 are £5,824 - £43,000.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/484972/review-of-ae-earnings-trigger-2016-2017.pdf

gradually increase to 3% from the employer, 4% from the employee, 1% in tax relief (total 8%). The employee may opt out of this arrangement in which case the employer is not obliged to contribute. In practice, some large employers contribute more than the auto enrolment defaults, although fewer small or medium sized employers do.

Pillar three: voluntary tax advantaged pension saving. The auto enrolment defaults above are the minimums. Employees (or employers) are able to contribute up to a maximum of 100% of earnings or £40,000[36], up to a lifetime cap that is currently £1 million (in the tax year 2017 – 18).

Pillar four: other voluntary savings. Tax efficient savings are popular - for example ISAs[37] - however over half of ISA owners approaching State Pension age (aged 45-64) have less than £9,000 saved in their ISA (Department for Work & Pensions, 2013).

4.5.2 The Levers: The UK Experience

(i) Means-testing: The defining moment of Britain's pension system was Beveridge's post war blue print for the welfare state (Beveridge, 1942). Beveridge placed personal responsibility at its core: "The state in organising security should not stifle incentive, opportunity, responsibility; in establishing a national minimum, it should leave room and encouragement for voluntary action by each individual to provide more than that minimum for himself and his family." (p.7, 1942). He had envisaged a state pension set at a generous enough level to avoid the problems of means testing. However, at the Treasury's insistence, the level set post war was inadequate from the start, and the national assistance board was set up to pay supplementary pensions. There then followed, from the 1960s to the 1980s a time of unconvincing forays into a more continental model. Governments were tempted to provide state pensions with a greater link to earnings, but ultimately were always frightened off by the cost (Bozio et al., 2010).

In 1999, to address creeping aged poverty[38], the new Labour government introduced a minimum income guarantee (MIG). This was designed to ensure that income

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[36] https://www.pensionsadvisoryservice.org.uk/about-pensions/saving-into-a-pension/pensions-and-tax/the-annual-allowance

[37] Individual savings accounts (ISAs) are tax efficient way to save in cash or shares. You make contributions to ISAs out of taxed income, but all earnings are tax free.

[38] As a result of the decision in 1980 to index the basic state pension to prices rather than earnings, the value of the basic state pension (never generous) had fallen to 15% of average earnings by 1997 (Hugh Pemberton et al., 2006 p.6)

for pensioners did not fall below a certain (poverty) level. However, as it was withdrawn pound for pound for any other income it was perceived as a profound disincentive for saving. Those who had put aside small amounts for their retirement faced an implicit tax rate of 100%. The Pensions Credit, introduced in 2003, was designed to reduce this disincentive to private saving, and it was tapered at 40%, meaning that those who would have otherwise been eligible for the pensions credit, only 'lost' 40% of their savings (Bozio et al., 2010). The Pensions Commission (Turner et al., 2004) set out the full extent of this problem. At the time of the first report in 2004 they calculated that around 40% of all pensioners were drawn into combined tax and benefit withdrawal of over 50%[39]. The report predicted that, if current policy was unchanged, by 2050 over 60% of pensioners would face the 40% withdrawal rate implicit in the Pension Credit, and many would face higher rates still due to the additional impact of tax. Means testing was a tempting way for the Treasury to target money at those most in need, but it did not sit well in a system where pension saving was voluntary. Consequently, the UK state pension was redesigned to its current form: as a flat-rate state pension, set just above the levels of means testing. The reforms were intended to increase clarity about what individuals can expect to receive in retirement. It was hoped that this should lead individuals to better engage with decisions about pension systems. Especially if they realise how little they can expect from the state (Crawford et al., 2013).

(ii) Annuitisation: In a pensions regime in which occupational pension saving was voluntary, arguably another inconsistent element in the UK's old system was the fact that annuitisation was effectively compulsory. When the state pension was means tested, the argument was always made that the public purse needed to be protected from private imprudence. Once the decision was made for the state pension to be moved to a flat-rate system, set above the level of means testing, then the need to protect the public purse from private imprudence was reduced. In 2014 George Osborne continued his reshaping of the pension landscape to support free choice and announced the end to compulsory annuitisation.

(iii) Tax incentives: The most obvious way to encourage people to defer income for retirement is through the tax system. There are at least three questions one might want

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[39] See p 226 and figure 6.15 of the First Report of the Pensions Commission.

to ask about the tax incentives given to saving: how much do they cost; are they 'fair'; and are they effective?

How much do they cost: In most countries public pensions are the largest single item of social expenditure, accounting for an average of 18% of government spending in 2013 (OECD, 2017). These cash expenditures on public pensions are relatively easy to establish[40]. However, the costs to the public purse of the tax incentives to save for retirement are less transparent. Table 4.1 (at the end of the chapter) outlines two alternative key estimates: the estimate of the total cost of tax relief as a % of GDP (OECD, 2017) and an estimate of the tax subsidy per unit (i.e. dollar, pound or euro) (Yoo & De Serres, 2005). Using the first measure, the total cost of tax relief as a percentage of GDP in the UK is 1.2% (column 3 of table 4.1), one of the highest in the OECD. This is estimated using the concept of "tax expenditures" which attempts to quantify the value of the preferential tax treatment given to pension saving, relative to a benchmark tax treatment. The OECD only has data available for 21 OECD countries and over two thirds of these have a figure of 0.2% or less. Only the UK, Australia (discussed later), Canada and Germany report tax expenditures on pensions of more than 1% of GDP. It is important to note that these figures are not directly comparable (as they depend on the benchmark tax chosen) and they are not equivalent to direct public expenditures. The figure will also depend on total participation rates and contribution rates, which again makes cross country comparison difficult (for example a country could have extremely generous tax incentives to save, but if few people chose to save in a pension, the total as a % of GDP would be lower).

An alternative way of conceptualising the generosity of tax incentives is that given by Yoo and de Serres (2005) (column four of table 4.1). This estimates the tax subsidy per unit (i.e. dollar, pound or euro) which makes it slightly easier to compare between countries. To do this Yoo & de Serres compare the amount of tax that would be paid over the entire length of the investment when that pound is saved in a pension, compared to when it is invested in a benchmark non-retirement savings vehicle. The size of the subsidy to pension saving (per unit of pre-tax contribution) is made up of three components: revenue forgone on contributions, revenue forgone on investment income and revenue

[40] It is very hard to directly compare expenditures between countries. For example, countries with favorable demographics (such as Australia) will find it easier to finance pensions.

collected on withdrawals. The average net cost, per unit of contribution, of pension tax breaks ranges from around 40 cents per dollar of contribution to around zero. Using this method, Yoo and de Serres again find that the UK is at the high end with estimated net costs of 29.9% per unit saved in a pension.

Are they 'fair': Is this amount 'spent' on tax incentives fair? The Institute for Fiscal Studies (2014) has argued that the fact that a large proportion of the cost of tax relief goes to those on the highest incomes should not necessarily be seen as a sign of 'unfairness', any more than is the fact that the same group pay a very high proportion of all income tax[41]. However, as they also note, current UK practice departs from a pure EET system in two main ways, and they suggest that both of these departures make the UK tax incentives for pensions over generous. First, in the ability to take 25% of one's pension pot as a tax-free lump sum, which is most generous to those with large pension pots. Second, in its treatment of pension savings in relation to the system of National Insurance contributions (NICs). When an *individual* contributes to their private pension the contributions made are not subject to income tax, but there is no relief given on *employee* National Insurance contributions. As National Insurance is (unlike income tax) not payable on pension income then this is consistent with a Taxed, Exempt, Exempt treatment. In contrast *employer* pension contributions are exempt from employer National Insurance contributions, which the IFS argue, is an overly generous and opaque subsidy (as anyone who has had to struggle through that last sentence will perhaps appreciate).

Others, however, have argued much more strongly that the current rate of tax relief is unfair. Johnson (2014) rebuffs the claim that tax relief is tax deferred not tax avoided, noting that only one in seven of those who receive higher rate tax relief when working go on to ever pay higher tax when they are retirees. He also argues that one of the largest beneficiaries of the current system is the financial services industry, which earns handsome commissions on the funds bought with Treasury funded tax relief. He cites Echalier et al.'s (2013) estimate that if a more progressive flat 20% rate of tax relief were to be introduced it would save the UK Treasury roughly £6 billion per year.

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[41] While high-income individuals receive most relief on their pension contributions, they also pay most tax. UK figures for 2012-13 show that the bottom 50% of taxpayers were liable for 10.6% of total tax, the top half for the corresponding amount of 89.4%. More than half the total of income tax is paid by the top 10% of taxpayers, with around ¼ paid by the top 1% (*UK Income Tax Liabilities Statistics*, 2016).

Are they effective: Finally, aside from normative issues of fairness, others have argued that tax relief is ineffective; in particular for those on low or median incomes. Chetty et al. (2014) looked at the extent to which tax subsidies increase total saving and find that those who most need to save more are the least responsive to tax incentives.

To summarise: the UK has a tax system, compared to other OECD countries, that offers very generous levels of incentives to save in a pension. The extent to which this is fair, or effective, is more debated.

(iv) Clarity and credibility: The Pensions Commission of 2004 identified the undue complexity of the UK's pension system as a key area that required reform (Turner et al., 2004). Complexity was preventing people from making informed choices about whether when and how much to save. As Pemberton et al. put it, the history of post-war pensions in the UK is that of the creation of "a maze of such complexity that users cannot make sensible decisions about their own lives" (2006 p.10). As to whether the UKs new pension system is credible, it seems questionable, given the UK's history, that the current commitment to a flat-rate, triple locked[42] pension will survive future governments' needs to contain pension spending, especially given projected demographic pressures. While current spending on state pension of 6.1% of GDP is below the OECD average – see table 4.1, this is expected to rise to 8.1% in 2050. A flat-rate-state pension while logical, indeed essential, in a voluntary system, can look unfair. There are repeated public calls that pensioners are being treated in an over generous manner compared to the rest of the population, and the Office for Budget responsibility has forecast that sticking to the flat-rate triple lock will add up to 1% of GDP to the cost of paying for state pensions (Stewart, 2015).

4.6 Australia

In many ways Australia's pension system can be seen as the mirror of the old UK pension system. Australia taxes pension contributions (at a concessionary rate) on the way in, but in retirement all superannuation income is taken tax-free. It compels individuals to save, but on retirement you are allowed almost complete freedom in how you draw down your income. What both the UK and Australia have in common (and in contrast to Sweden

[42] The triple lock is the commitment, introduced by the coalition government in 2011, that the basic state pension would rise by a minimum of either 2.5%, the rate of inflation or average earnings growth, whichever is largest.

discussed below) is that both have an arguably over generous system of tax relief (see table 4.1). In sum Australia has 'solved' the impossibility triangle by making pensions saving compulsory. As a consequence, it is free to means test the state pension, and does not need to offer over generous tax incentives in order to persuade people to tie up their money. Its system is well regarded (Melbourne Mercer Global Pension Index, 2017[43]). Expenditure on public pensions is low at 4.3% of GDP (compared to an OECD average of 8.2% (see table 4.1). This is partly due to its relatively benign demographic situation; Australia has a comparatively young population with a dependency ratio of 25 (compared to the UK at 31, and Sweden at 33.8 see table 4.1). However, as with most OECD countries, this dependency ratio is predicted to rise considerably. Arguably, however, there are two inconsistent elements within the Australian system: (i) the over generous tax incentives given to pension saving, and (ii) the level of freedom given in the decumulation phase, where (given means testing) there is an incentive for individuals to spend their savings too fast and fall back onto the state.

4.6.1 An Outline of Australia's Pension System

Before 1983 only 39% of the working population had occupational pension savings. Pressure grew to improve the retirement savings of ordinary working people and in 1982 legislation was introduced to compel employers to contribute to their employees' pensions. Currently the Australian system is made up of four pillars (Productivity Commission, 2015).

Pillar one: The means-tested Age Pension, provided by government, which guarantees a minimum 'safety net' level of income in retirement. In 2015 the full Age Pension for a single person was $22,542 (about £12,300[44]).

Pillar two: Compulsory saving through the Superannuation Guarantee, currently set at 9.5 per cent of wages, scheduled to rise to 12% by 2026. While compulsory this represents private saving, and is paid mainly into Defined Contribution accounts.

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[43] The Melbourne Mercer Global Pension Index (2017) accords Australia a score of 77.1 in its pension index, one of the highest in its cross country comparison. Their index gives each country a score in adequacy, sustainability and integrity. Based on the design of Australia's pension system (rather than its outcomes) it is regarded as having a pension system that scores highly in adequacy. This is somewhat hard to reconcile with the OECD figures that show that Australia has particularly high levels of aged income poverty. See table 4.1 for figures.

[44] At an exchange rate of 1 Australian Dollar to 0.55 British Pounds correct at 27.3.18

Pillar three: Voluntary superannuation savings, including voluntary pre-tax and post-tax super contributions.

Pillar four: Other voluntary savings that can contribute towards living standards in retirement, such as other financial assets, especially housing and other property.

4.6.2 The Levers: The Australian Experience

(i) Means-testing: Despite the compulsory superannuation contributions introduced in 1983 most Australians still rely heavily on the Age Pension. In 2011-12 median superannuation balances were only around $100,000 (about £54,000[45]), and only 17% of those aged 80 years or more had any superannuation savings left (Productivity Commission, 2015). These relatively modest superannuation balances mean that around 70% of Australians receive an Age Pension (the means tested safety net); of those 70%, around 40% only receive a part pension. As noted above, pension expenditure as a share of GDP is about half the OECD average, and the ability of the state to means test is one downward pressure on this spending. In addition, despite the lower share of GDP devoted to the age pension, the maximum level for a single person of $22,542 per annum (roughly £12,300) is generous compared to the level of the flat-rate pension in the UK[46]. However, while a system of means-testing sits well with a system of compulsory saving, the issue of how much freedom individuals are given in drawing down their retirement assets is more contentious.

(ii) Annuitisation: In Australia, on retirement, there is no obligation to annuitise pension savings. As retirement savings are tax free in payment, there is not even any tax penalty for drawing down one's savings too fast[47]. There has been considerable attention given to the fear that the flexibility Australians are given in drawing down their retirement assets may encourage people to exhaust their savings too quickly, leading to greater reliance on the state Age Pension. However, these fears may be overstated, the evidence is that most retirees are (in some cases excessively) prudent in their draw down behaviour (Productivity Commission, 2015). Nevertheless, the Australian system might look more

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[45] At an exchange rate of 1 Australian Dollar to 0.55 British Pounds correct at 27.3.18

[46] The maximum amount that can be claimed under the new state pension in the UK for 2016-17 is £155.65 per week (i.e. about £8,000 per annum).

[47] For example, in the UK, while there is now no compulsion to annuitise, the taxation of pensions in payment means that there is a considerable tax incentive to spreading out any savings over the years so as to minimize income tax payable.

coherent if it legislated for at least some level of compulsory annuitisation, to make sure retirees better spread out their wealth over their life time.

(iii) Tax incentives: On both measures, Australia gives among the most generous tax incentives for pension saving in the OECD. The total cost of tax relief, as a percentage of GDP, is 1.7%, the highest amount among OECD countries (OECD, 2017). Using Yoo & de Serres' measure of the subsidy given per 'unit' of saving, Australia is again very generous, with an estimated subsidy of nearly 30% per dollar saved. Both the Grattan Institute (Daley, Coates, Wood, & Parsonage, 2015) and the Financial System Inquiry Final report (*Financial System Inquiry Final Report*, 2014) have argued that the tax breaks are unnecessarily generous and should be better targeted towards the (poorly defined) objectives of the superannuation system. As outlined above, retirement savings can be taxed at three points: on contributions, on investment earnings, and on withdrawals. Australia, in contrast to the UKs EeT approach currently has a ttE approach to taxing most superannuation savings. In brief, pension contributions are taxed at a lower rate, as are earnings on those contributions, but in retirement the money can be withdrawn tax-free[48].

Daley et al. (2015) argue that "Superannuation tax breaks, as currently structured, are an unfair and costly way to promote retirement savings. By value, most of the superannuation tax breaks go to people on higher incomes" (p.26). In particular they point to the fact that given high income earners are likely to save and self-fund their own retirement that tax concessions that benefit this group do little to reduce future Age Pension liabilities. In contrast for those earning less than $18,200 (the level at which the tax-free allowance is set) the pension tax of 15% actually increases their tax, as otherwise

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[48] In more detail:
Tax on contributions:
Employers are required to contribute (currently 9.5% up to $200,000) of wages to a nominated superannuation fund. These contributions are taxed at a lower rate of 15% rather than the person's marginal tax rate. Individuals can also make voluntary contributions through salary sacrifice, again taxed at 15%. Total pre tax contributions (the 15% tax is levied on contributions when they are received by the super fund) must not exceed a cap of $30K per annum for those under 50 and $35K for those over. Individuals can also make 'post tax' voluntary contributions to their superannuation fund up to an annual cap of $180K.
Tax on Earnings:
Earnings on funds invested are taxed at a flat-rate of 15% (10% for capital gains). In practice the effective tax rate on superannuation fund earnings in the investment phase is typically lower – ranging from 7 to 10% depending on the mix of fund investments – after taking into account dividend imputation credits for investments in Australian equities (Daley et al., 2015). Those over 60 pay no tax on the earnings of their fund.
Tax on Pay-outs:
Payouts from the account are tax free from the age of 60.

this income would be tax-free. At the extreme upper end, there were 475 retirees with superannuation balances of more than $10 million who were receiving average income streams of more than 1.5 million nearly tax free. More crucially they argue that the progressivity of the tax system is a value choice and as such should be made as transparent as possible, and that current tax breaks not only favour the rich, but do so in a very opaque manner.

(iv) Clarity and credibility: It was argued in the section on the UK, that a pension system that relied on free choice needed a system that was clear enough that individuals are able to make well informed decisions. A system that relies on compulsory saving does not have the same short-term need for clarity and credibility in the system in order to induce people to part with their money. However, there are at least two areas in which the Australian pension system could improve in terms of clarity and credibility: by looking at the impact that high fees have on saving, and by clarifying the aims of the system.

Turning to the first issue of fees, while in Australia you are given little choice about how much you save, you are given a large amount of choice about where to invest your contributions. And it is far from clear that individuals understand the implications of their choices. As noted earlier, the impact of pension charges should not be underrated. Under plausible assumptions, over a working life, an annual administrative charge of 1 per cent of a person's pension accumulation will reduce the total accumulation by about 20 percent (Barr & Diamond, 2010b). In Australia in 2013 the average fee charged on pension accumulation was higher than this at 120bps or 1.2% (Financial System Inquiry Final Report, 2014). These fees are high by international comparison (for example in the UK there is a cap on charges for auto enrolment of 0.75%). The FSI further note that fees have not fallen by as much as would have been expected given the substantial increase in the size of funds invested. They argue that the key reason for these relatively high fees is the absence of consumer-driven competition. Put crudely, few consumers understand the impact that relatively small differences in fees can have on their eventual accumulation.

The second key issue, again highlighted by the Financial System Inquiry (2014), was the fact that the superannuation system does not have a set of common objectives. They argue that this lack of clarity was contributing to 'ad hoc short-term policy making, which imposes unnecessary costs on superannuation funds and members' (p.55) (see also Grattan Institute, 2015, who make a similar point). Ultimately (as argued above in the section on tax incentives) the FSI suggest that one of the consequences of this lack of an agreed policy framework has been to increase the cost of the system to the tax payer, as tax

concessions are 'not being efficiently targeted at meeting the system's objectives' (p. 127). The pension contract is probably the longest contract any individual will enter into, and cross-party agreement on the broad objectives of the system do much to support its credibility.

To summarise, in the UK one of the reasons for a lack of enthusiasm for retirement saving was confusion. This is clearly less of a problem in countries like Australia where you have no choice over whether or not to save. Nevertheless, there is consensus that there are at least two areas in which Australia's system lacks clarity and credibility: in its lack of overall objectives, and in the high charges it places on ill-informed consumers.

4.7 Sweden

In the 1990s the Pay as You Go (PAYG) Swedish pension system was under huge funding pressure, a result of demographic changes and early (over) generous promises. This precipitated an unusually radical redesign of their pension system. Kangas, Lundberg & Plough (2010) give a review of the background political and institutional dynamics that facilitated such a profound change[49]. The resulting redesign resulted in a highly coherent system which was based around five clear principles[50]. Sweden has chosen a combination of compulsory pension saving with weak incentives to save. In contrast to the UK and Australia, tax relief on private saving is much less generous. The guaranteed pension is means tested, and it is compulsory to convert both the first and second pillar of occupational pension savings into an annuity at retirement.

4.7.1 An Outline of Sweden's Pension System

In contrast to the UKs new single flat-rate pension, in Sweden the first pillar of state provision is made up of three elements (Barr, 2013):

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[49] They note that the degree of reform that Sweden undertook was unusual, not only because pension systems have such a strong build in inertia, but because the old ATP[49] system was, for the social democrat parties, a 'sacred symbol' (Moschonas, 2002) with the same level of emotional significance as the NHS has in the UK.

[50] 1. The Life Income Principle: That every krona of contribution for every person should count the same
2. Automatic adjustment to economic fluctuations
3. Automatic adjustment to life expectancy changes
4. A guaranteed pension
5. A part of a system that is fully funded and provides individual choice.

Pillar one:

1. The Inkompstpension: A state-organised, mandatory, partially funded, notional defined contribution (NDC) pension. Here accrual is based on a rule rather than the actual investment growth of a fund[51].

2. A premium pension that is based on fully funded individual accounts in which the worker chooses from a large number of providers. This forms a much smaller part of the pension[52].

3. A guaranteed pension, financed from general taxation, which provides poverty relief for pensioners whose income is very low. This is indexed to prices not wages.

Pillar two: In addition to these government-mandated pensions (the first pillar), there are also four large occupational pension systems. Most have contribution rates of 4.5% up to the income ceiling, and for higher earners can dominate the inkomstpension. This second pillar of occupational pensions is in principle voluntary, but in practice through collective agreements almost 90% of employees are covered.

Pillar three: Finally, the third pillar in Sweden is tax deferred private supplementary pension saving. Like the UK, deductions from taxable income are allowed for contributions, but for contributions up to a low limit, and the pension is taxable along with earnings when received (Diamond, 2009).

4.7.2 The Levers: The Swedish Experience

(i) Means-testing: As a consequence of its system of compulsory saving, Sweden is able to target its spending at the poor through means testing. The guaranteed pension (the poverty relief pension paid from general taxation) is tapered; it faces a taper of 100 per

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[51] The accrual rate applied to pensions in the accumulation phase is based on long-run average earnings. The earliest age at which you can take a pension is 61, and the pension is adjusted actuarially where the pension is taken later. When a person first draws their pension, their notional fund is multiplied by a life expectancy coefficient based on the life expectancy of that cohort. When a person first draws their pension benefits, his or her notional accumulation is converted into an annuity mimicking actuarial principles. Benefits in payment grow by the average rate of real earnings growth minus 1.6%. There is no adjustment made for family structure – each spouse receives the pension they are entitled to on the basis of his or her contributions, there are no joint life annuities and one's inkomstpension dies with the individual.

[52] The total contribution of 18.5% of the pension base is divided between 16% to the inkompstpension and 2½% to the premium pension). This 18.5% total contribution is made up of 7 % from the employee and 10.21% from the employer. The total of 17.21 is 18.5% of the pension base that excludes the workers 7% contribution (i.e. 17.21/0.93 = 18.5).

cent of inkomstpension up to a fairly low limit, and of 48 per cent above that. In 2012, the guaranteed pension was SEK 7,810 (about £670[53]) per month for a single person and SEK 6,967 (about £600) for each partner in a couple. In other words, up to this relatively low level (of between SEK 7,810 and SEK 6,967) for each krona of inkomstpension or premium pension[54] received one Krona of guaranteed pension is withdrawn. Then the guaranteed benefit is gradually tapered away for the near poor, until at between SEK 9,986 and SEK 11,266 it is withdrawn completely.

(ii) Annuitisation: Both first and second tier occupational pension's savings are annuitised at retirement. The accumulated notional balance of the Inkompstpension is converted into an annuity provided by the state, and the actual amount received depends on that cohort's life expectancy at 65. Occupational schemes are also paid as annuities (Haverland, 2007).

(iii) Tax incentives: While the system of tax relief for pensions follows broadly the same EET structure as that in the UK, it is much less generous for those on high incomes. In both the first and second pillars of pension saving, income tax is deferred until withdrawal. The third pillar of private supplementary pension saving also enjoys deferred income taxation, however this is only for relatively low limits of less than 2,000 USD per year. In common with the UK there is also partial (but heavier) taxation during accumulation. As can be seen in table 4.1 the tax subsidy per unit of contribution is estimated to be 13.2% compared to nearly 30% for both the UK and Australia. In Sweden the returns to saving are taxed at half the statutory tax rate for capital income (a far less generous treatment than in the UK) (Almenberg & Säve-Söderbergh, 2011). Yoo & de Serre (2005) argue that the difference between Sweden and countries such as the UK is essentially due to the difference in the treatment of investment income. Finally, there is no provision, as in the UK, for a tax-free lump sum. In sum, compared to the Australian and UK pension systems, the tax incentives for pension saving are less strong, and the limits for tax relief are much lower for discretionary private pension saving.

(iv) Clarity and credibility: Somewhat ironically, the country in which individuals have the least need to engage with their pension is where best practice is observed in the clarity of pension communication. Annual forecasts (called the *Orange Envelope*) are sent

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[53] Based on 1 krona to 0.086 British Pounds correct at 27.3.18

[54] But somewhat strangely the taper does not apply to occupational pensions, premium pension or earnings. See Barr (2003) for details.

automatically by mail each year giving the value of the individual's future public (i.e. first tier) pension benefits. Updated forecasts are available on line all year round (Almenberg & Säve-Söderbergh, 2011) and include information about the individual's occupational pension plan. This is a stark contrast to the UK (where individuals really do need to understand their pensions) where information is hard to get, complex and highly fragmented.

The Swedish notional defined contribution (NDC) scheme is an unfunded scheme based on notional individual lifetime accounts (i.e. there is no real underlying fund). However, unlike typical pay as you go (PAYG) public pensions, benefits are explicitly linked to contributions paid, so the accumulation of entitlements becomes transparent. This creates stronger property rights, as well as a sense of actuarial fairness. The 'growth' of the notional fund is an interest rate that corresponds to the growth of per capita income. When the accumulated notional balance is converted into an annuity, the actual amount received depends on that cohort's life expectancy at 65, thus the system automatically adjusts to both the tax base and demographic changes. In addition, there is an 'automatic balance mechanism'. The system is designed to be stable at contributions of 16%, if this target becomes endangered both NDC pension wealth and actual pensions in payment are temporarily indexed at a lower rate (Hinrichs, 2006). In other words, the Swedish system is both very clear, and has gone to considerable lengths to build a highly stable and credible system.

4.8 Discussion: How Free is 'Free' Choice?

This chapter had three purposes. The first was descriptive; to illustrate the ways in which the issue of choice in a pension system has been approached by different countries. The second objective was to make the argument that a pension system that prioritises free choice is more expensive that it might first appear. The third objective was to build an argument around the idea of institutional complementarity. As Barr has repeatedly argued pensions have multiple objectives, and any analysis should consider the system as a whole (Barr & Diamond, 2009).

The UK is an example of a pension system that has always placed an emphasis on individual responsibility and market provision. A system that prioritises choice has a far greater challenge in designing a set of complementary institutions, and the UK with its recent reforms, has shifted from a position of AB' (see figure 4.1 below) towards a corner solution A'B' with far more internal coherence. The story of pension reform since before

Beveridge has been one in which successive governments have tried to balance the conflicting trade-offs between poverty relief, cost minimisation and the maintenance of private incentives to save (Bozio et. al's 'impossibility triangle'). The new flat-rate pension, the reduction of means-testing, the removal of the compulsion to annuitise, the reduction of complexity, not to mention the role of auto enrolment, should encourage private incentives to save, but it is also likely to be more expensive (Bozio et al., 2010).

In contrast Sweden represents the alternative corner solution (AB in figure 4.1). Its pension system consists of a set of policies that are highly coherent: the state provides a compulsory, income related, first pillar; this is supplemented with near universal occupational pension provision that is only nominally voluntary. The compulsory nature of the system allows for extensive means testing. Compared to the Australian and UK system, the tax reliefs afforded to pension saving are far less generous, and the individual is accorded much less freedom in the decumulation phase. Gross replacement rates from mandatory public and private pensions are projected by 2050 to result in replacement rates of over 55% for the average earner compared to 22.% in the UK and 32% in Australia (see table 4.1).

The Australian pension system is somewhat unusual for a LME. In contrast to the UK, it has chosen a policy of compulsion for pension saving (although that saving is done through private institutions). This allows it to means test its first pillar. Its position straddling the two top boxes of figure 4.1 is due to (i) the absence of compulsion to annuitise (which sits poorly with means testing) and (ii) the arguably over generous nature of its tax incentives. Ultimately it is difficult to discuss a system's coherence, and thus the direction policy should take, without a clear consensus on what the policy objectives should be in the first place. Are tax reliefs to prevent income poverty, to prevent reliance on the state or to help with income smoothing? Daley et al. (2015) implicitly gives priority to the first two objectives. In contrast, as argued recently by the Institute for Fiscal Studies (2014), one can make the argument that the fact that a large slice of tax relief goes to high income individuals purely reflects the fact that this group pays the largest share of income tax revenues. In other words, the degree to which you believe the system is coherent or not, depends partly on the normative weight given to the different objectives of a pension system. Nevertheless, if the principal objectives of the Australian pension system are to prevent income poverty and to prevent reliance on the state, then the current system of generous tax relief plus the lack of compulsory annuitisation looks incoherent.

	A: Weak incentives	A': Strong incentives
B: Occupational pension saving compulsory	Sweden Australia	
B': Occupational pension saving voluntary	UK before recent changes	Current UK system

Figure 4-1 Model of the Logic of Choice

4.9 Limitations

One of the central arguments in this chapter was that a system that seeks to encourage free choice is more expensive that it might at first appear. It is not, however, easy to compare the costs of a pension system between countries. To start with cost alone is no measure of how well a system performs, and must be weighed against outcomes (such as gross replacement from pensions and aged poverty which are included in table 4.1) all of which will differ according to the respective benchmarks chosen. Even then it is almost impossible to make cross country comparisons as demographic variables will hugely influence the cost of providing pensions. Estimates of the cost of tax relief are also not directly comparable as, again, they depend on the benchmark tax chosen, and they are not equivalent to direct public expenditures.

The issue of how to measure complementarity is also contentious. There is no one single measure of the performance of a pension system, as Esping-Andersen (1990) argues, a simple measure of state spending cannot be a good measure of how well a welfare state is performing. Multiple aspects need to be considered, and there will be normative conflicts about which aspects receive priority. As noted at the beginning of this chapter, one

measure of institutional complementarity is through a comparison of output or performance. Alternatively, one can argue that complementarity is implied when certain combinations are regarded as stable. For example, in the context of this discussion a lack of compulsion to save for retirement sits badly with means testing – as the combination will be a profound disincentive to save.

There was no attempt to claim that either of the coherent models (Sweden and the new UK model) was 'better' than the other, however it was implied that each coherent model is more stable than the respective incoherent sets of potential solutions (weak incentives + voluntary saving or strong incentives + compulsory saving). The evidence offered in the case studies and in table 1, provide an indication only. As such this model can only be a conjecture, ready to be corrected, modified or given up if demonstrated to be false (Popper, 1963).

4.10 Conclusion

To summarise, this chapter has argued that the different parts of a pension system need to be considered as a whole; and a pension system is coherent when the presence or particular form of one part of the system reinforces the functioning or efficiency of another part, in another area. A secondary implication, rooted in Bozio at al.'s idea of the impossibility triangle, is that a system that prioritises free choice is more expensive than it might first appear. The UK has recently redesigned its pension system, in a move that makes it more internally coherent, putting free choice at its heart. In the words of the then Minister of state for Pensions "it is an appropriate time for Government to withdraw from the role of providing an earnings related pension, and return to a single flat-rate state pension that keeps people out of poverty and provides a firm foundation for saving." (DWP, 2013 p.18). As Bozio et al. (2010) note, a universal flat-rate pension can prevent poverty in old age, without undue impact on the incentives to save, but will imply a large cost to the state in the form of higher taxes. To the extent that these taxes distort behaviour elsewhere in the economy, the costs of free choice are met in other parts of the system. Setting aside the no less controversial question of whether people, if given choice, will then go onto make good decisions, even the first step - creating a system in which saving makes sense if you are rational - comes at a considerable cost.

The following chapters turn to consider the implications of choice from the perspective of the employer and the individual. Chapter 5 asks what incentive (profit-

seeking) employers have to provide occupational pensions. Chapters 6 to 8 look at whether, if given choice, individuals go on to make ‘good’ choices.

Table 4-1 *Table of estimates of pension costs and outcomes for UK, Sweden & Australia*

	Costs				Outcomes		
	Public expenditure on pensions (% GDP)[1]	Projected increase in public expenditure on pensions (% GDP) in 2050[2]	Cost tax relief (% GDP)[3]	Tax subsidy per unit of contribution (Yoo & De Serres 2005)[4]	Aged income poverty (relative measure)[5]	Gross replacement from mandatory public and private pensions (projections)[6]	Dependency ratio (2050 projection in brackets)[7]
UK	6.1%	8.1%	1.2%	29.9%	13.8% (10.9%)	22.1% (52.2%)	31.0 (48.0)
Sweden	7.7%	7.2%	N/A	13.2%	10% (9%)	55.8% (55.8%)	33.8 (45.5)
Australia	4.3%	3.7%	1.7%	28.5%	25.7% (12.8%)	32.2% (32.2%)	25.0 (41.2)
OECD	8.2%	9.5%	0.4%	21.5%	12.5% (11.5%)	52.9%	27.39 (53.2)

Notes:
All figures from OECD (2017) except for tax cost per unit of contribution (Yoo & De Serres, 2004)
1. Public expenditure on pensions: (OECD, 2017 p.143). Figures are for cash benefits in 2013 as a % of GDP.
2. Long–term projections of public pension expenditure: (OECD pensions at a Glance 2017 p.147). Public spending on pensions in most OECD countries is expected to rise. The main driver of this is demographic change. All figures are for 2050, except for Australia which is 2055.
3. Cost of tax relief (% GDP): (OECD pensions at a Glance 2017). The costs of favourable tax treatment for retirement savings is measured using the concept of "tax expenditures". This attempts to quantify the value of the preferential tax treatment relative to a benchmark tax treatment.

Data on tax expenditures for retirement savings are only available for 21 OECD countries, and in more than half of these countries they are less than 0.2% of GDP. Tax expenditure figures come with important caveats: they are not comparable between different countries because of differences in the benchmark tax system chosen. Only in four countries: Australia, Canada, Germany and the UK are reported tax expenditures worth more than 1% of GDP (see p.145).

4. Tax cost per unit of contribution (Yoo & De Serres, 2005 p.100). Estimate of the tax subsidy per unit based on a present value methodology. This compares the amount of tax that would be paid over the entire length of the investment when that unit (pound/dollar/euro) is saved in a pension, compared to when it is invested in a benchmark non-retirement savings vehicle.

5. Aged Poverty: (OECD pensions at a Glance 2017). This measure treats poverty as a relative measure. It shows the proportion of those aged over 66 with incomes less than 50% of median household disposable income. The figures are in brackets are for the whole population. The OECD suggests that one reason for Australia's relatively high figure for aged poverty is the lack of annuitisation in retirement (See p.135).

6. Gross replacement from mandatory public and private pensions (OECD pensions at a Glance 2017) (table 4.5 p.105). The projected gross replacement rate shows the expected level of pension benefits in retirement from **mandatory public and mandatory private pension** schemes relative to earnings for someone who started work aged 20 in 2016 and works full time until retirement age. It shows the figures for those on average (mean) earnings (the OECD table also shows replacement rates at 0.5 average earning and 1.5 times average earning). This figure does not include the replacement rate derived from voluntary private pensions. (The total including voluntary pensions is in brackets).

7. Dependency ratio (OECD pensions at a Glance 2017). This is the number of individuals aged 65 and over per 100 people of working age (defined as those aged between 20 and 64) in 2015.

5 The Employer's Perspective

5.1 Introduction

This chapter looks at the question of pension choice from the perspective of the employer. Compared to many other countries, employers in the UK have always been allowed considerable discretion with respect to occupational pensions. Consequently, there has been huge variation in the level and type of pension that employers have offered. Occupational pension coverage reached its peak in 1967 when about 48% of private employees (and 61% of public sector employees) were covered. From this point, pension coverage in the private sector began to decline, falling to 38% by the turn of the century (Clark, 2006). Furthermore, from the 1990s, in response to the increasing costs of providing defined benefit (DB) pensions, private sector employers retreated from DB schemes, with most shifting new staff onto much less generously funded defined contribution (DC) schemes. Currently the average contribution (among private sector employers) into a DB pension is 22.7% (split between 5.8% from members and 16.9% from employers), compared to just 4.2% into a DC scheme (split between 1% from members and 3.2% from employers) ("Occupational Pension Schemes Survey: UK 2016," 2017). These figures suggest that employers have become somewhat disenchanted with pensions.

This chapter reports the findings of a qualitative study, based on fifteen interviews with senior executives of private sector firms. It asked them what was the rationale behind the design of their occupational pension, and what, if anything, they felt that the firm got out of it. As McCarthy (2006) notes, there is a considerable amount of attention paid to how state provision should be structured, but rather less about the economic justification for occupational pensions.

It argues that the only reason a profit-seeking firm would choose to reward employees in the form of a pension (rather than pay), is if employees prefer to be paid in that manner. However, due to bounded rationality and bounded self-control, employees undervalue a pension compared to the cost to the employer to provide it.

This chapter proceeds as follows: First it reviews the literature on why an employer might choose to offer a pension. From this, three research propositions are derived. It proceeds to outline the methods, followed by the results. A discussion follows in which

the results are analysed with reference to the research propositions. It finishes with a brief discussion of the study's limitations before concluding.

5.2 Theoretical Background

This section outlines the theory on the possible reasons why an employer might choose to provide a pension. The literature review traced many of the historical explanations for the growth of occupational pensions. Paternalism was one explanation; but they were also used as a managerial tool. The growth of large bureaucratic modern firms meant businesses needed a cadre of employees that they could delegate to, and pensions were seen as an effective way to build trust (and reward honesty). Early on they were used in an attempt to fend off unions[55]. Post WWII high income tax made pensions an efficient way to pay people. Union coverage grew, and unions, initially sceptical, began to encourage their members to demand pensions. Labour was in short supply so had plenty of bargaining power. Critically, as Hannah (1986) outlines, for much of the 20th century, pensions were not expensive to provide.

Economic analysis offers a more formalized perspective on the reasons why a firm would choose to pay in the form of a pension rather than just with current pay. There are two principal ways through which one can consider the incidence of occupational pensions: from the demand side (what is it that affects employee demand for pensions) and from the supply side (reasons other than employee demand for why employers might want to provide pensions) (Dorsey et al., 1998). McCarthy (2006) argues that, from both these perspectives, pension schemes owe their existence either to missing markets (what McCarthy refers to as 'incomplete' markets), or to imperfections in labour and capital markets.

In a complete market, there is no need for employers to provide a pension, as workers are able to set aside a portion of their pay and invest it as they choose to provide for their retirement. Under this scenario workers would only work for a company that provided a pension, if the amount of wages forgone was less than the cost of replicating the pension offer themselves. However, if capital markets are incomplete (i.e. individuals are not able to trade on the capital markets in the same way as firms) and if there are labour or capital market imperfections, then this result no longer holds and a pension can create

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[55] Hannah (1986) notes that the strikers of 1926 forfeited all their pension rights.

economic value. McCarthy considers this creation (or destruction) of value from both perspectives: that of the employee and that of the employer.

From the employee's perspective (the demand side), the most obvious reason to prefer to be paid in the form of a pension is the tax benefit. McCarthy also argues that if individuals are risk averse, and firms are risk neutral, then the employer can create value in the employment contract by offering a pension which shields employees from risk. By offering a DB pension an employer is protecting employees from longevity, investment and insurance risk. In theory, the employer charges for offering this insurance by reducing wages by more than the expected cost of the risk. Transaction costs are another market imperfection that potentially create value in an occupational pension. By virtue of their size, large organisations are normally able to access capital markets more cheaply and flexibly than individuals and so are able to create value.

From the supply side perspective, McCarthy puts forward a set of reasons, apart from employee demand, why a rational employer might want to pay in the form of a pension. Pensions have been associated with reduced turnover. McCarthy cites Allen et al. (1993) who found a significant negative relationship between job turnover and pension coverage. There is, however, debate about whether the reduced turnover is caused by the pension penalty for leaving a job with a DB pension, or that individuals self-select into 'steady' jobs, or just that jobs with pensions are normally better paid anyway, thus associated with lower turnover.

Dorsey (1998) makes the argument that pensions can raise productivity. This is based on the logic that they must create value sufficient to offset their costs. If they did not create value, then employers would prefer to attract workers at a lower cost by offering DC plans. McCarthy (2006), however, (as Dorsey also concedes) argues that there is little evidence that workers with pensions are any more productive than those without. In fairness, it is notoriously hard to measure productivity other than for the simplest tasks. Ippolito (1997) has argued that DC pensions can raise worker quality and productivity independent of the traditional productivity benefits claimed for DB pensions. His central proposition is that low discounters are more productive workers and that a pension is an ideal way to sort low and high discounters. For example, he argues that individuals with low discount rates are more likely to consider the long-term implications of their current work performance, they are more likely to work hard to gain promotion, they are less likely to shirk. This will reduce the need for firms to pay for costly monitoring. He tests this using data on sick leave taken by federal workers (as a proxy for discount rates),

finding that those that did not use up any of their sick days were paid, controlling for tenure and selected demographic variables, 15% more than those who used up all their sick days. As one's internal discount rate is a hard-to-observe quality he argues that it follows that firms will search for ways to sort workers by their internal discount rates.

An alternative way pensions can be associated with higher productivity is suggested by Akerlof's theory of gift exchange. Akerlof (1982, 1984) points out that management, in order to make the best use of 'labour', must find a way to enlist willing cooperation to go above minimum levels of effort. He hypothesised that a higher than market wage can be seen as a partial 'gift', part of a reciprocal exchange that buys loyalty. In effect part of the wage is perceived as a 'gift' and will be reciprocated by the worker in the 'gift' of extra effort. From this perspective, a good pension can be seen as a "gift" to the employee to engender cooperation and loyalty. Firms, wanting motivated labour will choose to pay workers in excess of the market-clearing rate, and this reasoning will also apply to pensions.

From this perspective, there is clearly room for pensions that are set above the legal minimum to be seen as one form of efficiency wage. Of course, this does not answer the question of why a firm would choose to pay the efficiency wage in the future (as a pension) rather than in the present. If there is a difference in the effectiveness of an efficiency wage versus an efficiency pension it might be found in the different message that both send to the employee about the nature of the employment contract. Spence (2002) argues that there are many markets where asymmetric information is pervasive, and one way to overcome this asymmetry is through the use of signals. In other words, the pension offered by an employer is an important message, reflecting more than the quantitative amount of money transferred, it represents a signal about what type of employment relationship is being offered.

Pensions may also be useful to employers as a way to influence the timing of the retirement decision. Barr and Diamond (2006) describe how firms may alter the design of DB benefits to encourage employees to either delay or bring forward retirement dates, as is in the firms' best interests. McCarthy argues that there is almost universal evidence that DB pensions are effective at managing when people retire.

Turning to consider the perspective of behavioural economics, it is clear that we are not always the rational, well informed creatures as modelled in economic theory. Employee demand for a pension is likely to be subject to many behavioural biases. In particular, as described in the literature review, this theoretical perspective has focussed on

under saving for pensions as a 'decision error' that we should be nudged out of. Our decision-making is informed by numerous predictable irrationalities, and bounded rationality[56] (Simon, 1995) and bounded self-control (O. Mitchell & Utkus, 2004) suggest that employees might undervalue pay when it is in the form of a pension.

This chapter bases its analysis of the factors that influence the choice and design of an occupational pension from an economic standpoint, however this is not the only relevant starting point. An institutional perspective is another potential theoretical lens through which to analyse the structure and incidence of occupational pensions. As North has argued, informal social norms can have a surprisingly strong influence on economic activity (North, 1990). DiMaggio & Powell (1983) argue that, where firms are partly insulated from competitive pressures, that 'institutional isomorphism' will explain why they adopt certain practices: "Organisations compete not just for resources and customers, but for political power and institutional legitimacy, for social as well as for economic fitness" (p.150). They argue that these isomorphic pressures are expected to work despite there being no evidence that any of the practices in question raise efficiency: "as an innovation spreads, a threshold is reached beyond which adoption provides legitimacy rather than improves performance" (p.148).

To recap: overwhelmingly, all private sector firms have moved from offering DB to DC pensions (that is where they offered a pension at all). From the economic perspective discussed above, this raises two key questions: Do employers still see any supply side benefits to offering a pension? Many of the benefits to an employer of providing a pension discussed above are associated with DB pensions. It is far less obvious that DC pensions can be used in the same way as a tool to manage the labour force. This leaves employee demand as arguably the key reason for employers to provide occupational pensions. The second question is then, given evidence of bounded rationality and bounded self-control, do employees undervalue a pension compared to the financial cost of providing it? In sum, have occupational pensions (at a level set above that mandated by the state) become a value destroying proposition for most firms?

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[56] It is not only individuals that suffer from bounded rationality or bounded self-control. As the literature review revealed, governments have often, deliberately or otherwise, miscalculated the costs of pensions. Employers also have perhaps not always understood the full implications of the pension promises that they have made. It can be easier for both to ignore the build-up of costs that some other manager or government will have to deal with.

5.3 Research Propositions

Based on the evidence outlined above, three research propositions are put forward for this chapter:

Proposition 1: There are no supply side benefits to the firm in providing defined contribution occupational pensions.

Proposition 2: Employees undervalue occupational pensions because of bounded rationality and bounded self-control.

Proposition 3: As a consequence of proposition 2, firms will respond to reduced demand either by offering the minimum level of pension provision required by the state, or by offering flexible pension benefits to target spending at those employees who place the highest value on a pension.

5.4 Method

Qualitative researchers argue that if you want to ask 'how or why' questions rather than 'who/what/where/how many/how much' questions, then qualitative research is most appropriate (Yin, 2013). Yin further argues that qualitative research is best when it is asking about contemporary events over which the researcher has no control. As the study was asking not about the incidence of particular pension plans, or the level of contributions made to pensions, both of which are well documented, but rather the logic behind the design choice, a qualitative method was selected. The goal of the study was to produce evidence that relates to theory (analytic generalization) not statistical generalization (Yin, 2013).

The epistemological position taken here (and throughout this thesis) is from the realist tradition that accepts a positivist perspective. This perspective on knowledge assumes that it is possible to use scientific methods, with propositions that are verified or falsified by empirical observation, to undercover, if not laws, then patterns according to which human events occur.

The research method used was that of a case study of fifteen organizations, using interviews (plus a couple of documents to corroborate or supply further evidence). The unit of analysis was that of the firm, and the aim of the research was to ask employers the logic behind the design of their occupational pensions. Neoclassical economics is preoccupied with the individual as the prime mover within the economy. However, as

Simon (1947) long ago noted, most important economic action is undertaken not by individuals but by large organisations. And for an individual's retirement income, the decisions taken by their firm are likely to be of overwhelming importance. In all cases the person interviewed was the most senior person available that either understood, or had formulated, the design of the firm's pension policy. In smaller firms this was the founder or CEO. In larger firms this was the HR director, or the pension manager. All interviews were recorded and transcribed.

Defining the Sample

The sample was restricted to private sector employers as they face varying levels of competitive pressures, and were more likely to have made changes to their pension plans. The most recent finding of the Workplace Employment Relations Study (Van Wanrooy et al., 2013) gives an indication of the size and type of firms in the UK economy. In 2011, in terms of percentages of workplaces, small firms dominate the economy; only 1% of firms have more than 500 employees. However, that 1% employs 21% of employees. Overall 50% of employees are employed in firms with fewer than 99 employees. The final sample in this study covered a broad range of sizes: the smallest firm had 16 employees, the largest over 18,000. It spanned a comprehensive range of industries including financial services, retail, food services, and energy (see appendix A.1 for summary demographics).

The majority of firms had seen considerable changes to their pension design. All the firms interviewed only offered DC type pensions to new members. While a few of the larger firms had legacy DB pensions, none were now open to new members. The type of pension offered broke down into three broad groups. First, seven out of the fifteen interviewed only offered auto enrolment minimums[57]. These were all firms that were small, or had lower skilled employees. There was a second group that offered a flat-rate employer match of medium generosity[58] (between 5% and 7.5%). These firms were all medium sized, and all had a higher skilled work force. For example, the *Independent TV Company* offered all employees who had been there for two years a match of 5:5. Finally the third group, who offered the most generous contributions, all did so on a flexible

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[57] These were: The *Fashion Agency, Fashion PR, Large Clothing Retailer, Large Restaurant Group, Mortgage Brokers, Large Manchester Based Retailer,* and *Small Training Firm.*

[58] These were: *The Architects, Independent TV Company, Challenger Bank* and the *Data & Communication Business.*

basis[59]. These firms were all very large and had a higher skilled work force. For example the *Consultancy Firm* matched each 1% the employee contributed with 1 ½% from the employer, capped at 12% from the employer (for a total of 20%). Finally, it was not uncommon to offer pensions of differing generosity to different parts of the workforce (see appendix A.1 for a summary of pension details).

In non probabalistic sampling, the size of the data set is typically set at the point at which no new information is being collected (the concept of "saturation"). Guest et al. (2006) provide more concrete guidelines for when it might be reasonable to conclude that saturation has been reached. They found that saturation typically occurs within the first twelve interviews. Consequently, the sample size for this study was set at 15 interviews.

Access to the subjects was through the researcher's personal and professional network, and through the contacts of one of her PhD supervisors. In particular an attempt was made to speak to employers who had made some change to their pension provision as that would perhaps illuminate the rationale more clearly.

5.4.1 How Interviews Were Conducted

Interviews were semi structured and the template for the interview is in appendix A.2. In contrast to qualitative techniques such as grounded research the interview template involved the use of some pre-formulated questions, however there was no strict adherence to them. Some new questions emerged during the interview process, although there was an attempt to maintain some consistency across the interviews. Questions were generally open ended, and attempted to avoid leading the respondents down paths that might be suggested by the literature.

All interviews were conducted face to face, apart from one skype interview and one telephone interview. They took place over a period of about four months. Interviews started with a brief outline of the research question, assuring respondents of anonymity, and requesting permission to record the interviews. All interviewees agreed to be recorded. In line with the LSEs guidelines regarding the management of data, direct and indirect identifiers of the interviewees were removed from the details in this chapter. The

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[59] These were: *The Consultancy Firm, the Major Defence Contractor,* and the *Multi National Energy Company*. Also the Professional Services Partnership offered a flexible match to their employees, although it should be noted the interview only discussed the logic behind their partner's pension.

recordings and transcripts of the interviews were stored on the researcher's password protected LSE hard drive.

5.4.2 The Method of Analysis

The method chosen for the analysis of the interviews was template analysis as described by King (2004). An initial template for analysis was based on the themes that were suggested by the literature review, these themes were then revised and supplemented in light of the ongoing analysis. This was done by hand, the researcher read through the transcripts to first identify potential themes, returning to the scripts to then mark them up, indicating the frequency of the reference to key themes and sub themes.

5.4.3 Template for Coding

There were two overarching themes to explain the incidence and design of occupational pensions that emerged from the literature: (I) economic and (II) behavioural economic. The economic perspective was subdivided into demand and supply side reasons. Demand side reasons were further segmented following McCarthy's analysis which suggested the key drivers for employee demand were a result of (i) the tax advantages offered by pensions, (ii) differing attitudes to risk, and (iii) transaction costs. The supply side reasons, drawing from the economics literature, considered the multiple specific reasons why a firm might prefer to pay in the form of a pension, and looked at the impact that an occupational pension could have on turnover, productivity, gift exchange/ signalling, and the timing of retirement.

The insights provided by behavioural economics suggested two overarching reasons why employee demand for a pension might be low: bounded rationality and bounded self-control. One key new factor that informed pension design emerged during the interview process: (i) the need for choice and flexibility. The template used for coding is in appendix A3. See figure 5.1 below for exemplary quotes for each theme.

5.5 Results

A summary table of the results (table 5.1), with the key used for coding, is at the end of the chapter.

5.5.1 Supply Side Reasons

Overall, the majority of firms (nine out of the fifteen) saw no supply side reasons at all to provide a pension. The CEO of the *Fashion Agency* put it characteristically bluntly: "if we thought there was a commercial advantage to offering over and above the statutory requirements, we would". Of the rest, only one (the *Professional Services Partnership*) had a compelling set of supply side reasons for their pension design, and this was for somewhat unusual reasons that are discussed at the end. The only benefit that firms could see in a pension (aside from employee demand) that was mentioned more than once, was the idea that a pension sent a message or signal about the firm (mentioned by five employers).

Reduced turnover: None of the firms interviewed[60] said that their current (DC) pension had any impact on reducing turnover. The HR manager of the *Challenger Bank* said "it's the thing to get them through the door, in terms of the package. Once you are there you kind of accept that it's there and you are going to get it, so does it retain people in and of itself, I wouldn't say so, it's just part of the overall package that you require to pay people". Two of the firms that had had DB pensions in the past, said that they thought that a DB pension had had a retention effect, but one questioned both whether a) this was necessarily a good thing, and b) if it was worth the cost: "So I think for the group who are in the final salary plan, I think we have traditionally got, certainly retention effect - whether you go as far as to call that a loyalty effect is another matter...I would probably question whether we got enough of that to warrant the cost but I think we have got something. Absolutely" (Head of Benefits of the *Multi-National Energy Company)*. In sum, no one thought a DC pension had any impact on retention, and a couple questioned whether the retention effect of old school DB pensions was ever desirable in the first place[61]

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[60] The exception was the *Professional Services Partnership.* However, of all the supply side benefits the Partner discussed, reduced turnover was perhaps the least important: "But, actually, it goes fairly quickly. I can't ever remember thinking there is a possibility I won't vest, it didn't really cross my mind."

[61] The HR director of the *Independent TV company* actively wanted to encourage people to move around: "people move around the industry a lot, and it's healthy that they are working on different productions, so um……we need that flexibility". The HR manager of the *Challenger Bank* also thought that even if a DB pension did tie people in, this was not always a good thing. When describing her previous experience: "there were people who were at the top who had defined benefit schemes and everybody knew they weren't going anywhere because of that...and so it did potentially give issues for junior people wanting to progress" "the people that had it, said they were never going to leave, but they potentially became disgruntled about things

Increased productivity: Lazear (2000) notes that financial incentives can potentially increase productivity through two mechanisms – through the incentive effect (raising the productivity of your existing workers) and through sorting (by attracting more productive workers, and encouraging the less productive to leave). No one mentioned a pension as having any incentive effect. The Head of Performance & Reward of the *Major Defence Contractor* referred to cash benefits as a hygiene factor, referring to Herzberg's famous distinction (1966): "The best pension scheme in the world won't be enough to attract, retain and motivate in a world where we have all got different motivations that aren't necessarily financial".

Regarding the sorting effect, while quite a few firms *did* see benefits as a way to attract a certain type of employee, no one saw their current pension as one of these benefits. The Head of Benefits of the *Multi-National Energy Company* said that a DB scheme might have had these effects, but he did not feel that this applied to their current DC scheme. The firms looking to attract millennials spoke more about cultural benefits as a way to attract millennials. The CEO of the Fashion PR mentioned life drawing classes or cookery courses "It's like they expect almost to be entertained or engaged...so it's almost expected within our industry". The *Small Training Firm* echoed this, he described his company as "quite millennial" and said that "I don't think [pensions are] in the top of the priority chain given the nature of people that we employ...one of the things that we are exploring at the moment is to have what we are going to call like a fun day pass, where every month you get to try and do something new, that in some way could be related to your work here". The Head of HR of the *Data & Communication Business* offered 'cool things' such as unlimited paid holiday, bring your pet to the office, volunteer days, all geared to attracting millennials. In sum, the idea of pensions as a sorting device was not at all supported by the evidence.

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and then became fed up with the firm for putting them in that position, it was quite, it is quite…it does cause issues, quite stark issues"

Themes	Definition	Exemplary quotes
Demand side reasons		
Demand side reasons in general	Do employers feel there is employee demand for a pension?	"Never ever have I had a discussion with a prospective employee and pensions been on the top, it just doesn't register." (CEO, *Fashion Agency*) "At the top end of the age spectrum, not the top end – mid to top end of experience might be a better way to express it – it's an important tool for recruitment and retention and becoming more so because a lot of these people have not made adequate pension provision earlier in their careers" (Partner, *Consultancy Firm*)
Tax	Do employees understand tax advantages of pensions?	"I don't even understand the tax benefits" (Director, *Architects*) "Some might do, the sophisticated ones, some on the very high salaries that are financially more articulate. Older people, maybe, people over 40 would understand. But I think most of the workforce, you know the millennials, absolutely not, and don't care" (CEO, *Fashion Agency*)
Supply side reasons		
Supply side reasons in general	Do employers see any advantage in offering a pension above and beyond the legal minimum?	"If we thought there was a commercial advantage to offering over and above the statutory requirements, we would" (CEO, *Fashion Agency*)
Gift exchange	A pension as a 'gift' and a signal about the employment relationship.	"It is something you use to prove to the employee that you are interested in them. You are concerned about their long term future. Even if you accept that it might not be with you. I think that message is really powerful" (Head of Performance and Reward, *Major Defence Contractor*) "I think we are kind of showing where our priorities are…..we invest in family, friends, your future….I would think that it speaks of what we care about" (Head of HR, *Data & Communication Business*)

Timing of retirement	Are pensions a way to manage the retirement process?	"People stay in a company for 3, 4 years. They don't stay in a company for…so this aging workforce thing….doesn't mean anything" (CEO, *Fashion Agency*) "it's intended to enable us to… quite frankly to be able to separate from long serving employees when they are in a position financially and capable to be able to do it, rather than doing it on the basis of capability. That's an important commercial aspect to the design." (Partner, *Consultancy Firm*)
Behavioural economics		
Bounded rationality	Was of a lack of pension understanding discussed as a reason for pension design.	"For them there is this sense, this whole sense around pensions, that is this thing that nobody understands and so therefore they just don't touch it. They don't think about it" (HR Director, *Large Clothing Retailer*) "yes, it's great to give a pension but actually you need to educate people for them to fully appreciate the value of what it is that they have got" (HR Manager, *Challenger Bank*)
Bounded self-control	Was a preference to have the money now discussed as a reason for pension design?	"I think that most people think that they would rather have £50 extra this month to go out on a Saturday night" (Director, *Architects*) "I just don't think that it's even on their radar" (Head of People, *Large Restaurant Group*)
Choice and flexibility	The need to offer flexibility in the pension offer.	"I think we just have to balance and respect that people have different needs at different times in their life cycle….This generation they have clocked up significant student debt, and they are desperate to get on the housing ladder and move on in life, and saving for a pension is not their top priority. So why would we force them to save 8% of their pay into a pension scheme, even though we would match it with 12, that would alienate them. That would seriously impact on our ability to recruit, so we give them the flexibility" (Partner *Consultancy Firm*)

Figure 5-1 Exemplary quotations

Gift exchange / signalling: One of the earliest justifications for occupational pensions was as a tool to help develop a willing cadre of employees that could be trusted and delegated to. As Akerlof (1982, 1984) puts it, the most important task of management is to find a way to enlist willing cooperation to go above minimum levels of effort. This was the only supply side reason for an occupation pension that in any way resonated more widely. The Head of Performance & Reward for the *Major Defence Contractor* said "It is something you use to prove to the employee that you are interested in them. You are concerned about their long-term future. Even if you accept that it might not be with you. I think that message is really powerful". The CEO of the *Independent TV Company* explained that they offered a pension set above auto enrolment levels because "we try and be,… try and present ourselves as …one of the nice places to be, you're well looked after, we see ourselves as the premium brand". The Senior HR manager of the *Challenger Bank* said "I do think there is a message there that we are not just caring about you now but we care about the longer term". The *Data & Communication Business*: "I think we are kind of showing where our priorities are...I think it really ties into our values…. So, we invest in family, friends, your future...I would think that it speaks of what we care about". Even the Founder of the *Small Training Firm,* who only offered auto enrolment minimums, said that he worried about what that communicated to his employees: "It sends the message. It just says, we are doing the minimum, which is not really what I like us to do. I always like us to give a bit more, if that makes sense".

Timing of retirement: The classic reason for a firm to offer a pension has been to help manage the retirement process. The former Head of Pensions of the *Large Manchester based Retailer* corroborated this: "It's a family firm that has been going for years and years. His father, his grandfather had always offered people a pension, and obviously in those days people worked for the firm for 40 years. And at the end of the day his father, his grandfather could look the employee in the face when they retired and know he was going to get a decent pension. And that was incredibly important to xxxx and he wanted to do the same thing". The next generation of owners did not feel the same, they had just closed the DB pension to new entrants and now auto enrolled at minimum contributions. More generally the idea of using a pension to manage the retirement process was seen as completely irrelevant by all but two of the firms interviewed. The CEO of the *Fashion PR* laughed when asked the question: "God, I think…I don't think we have ever had anyone who has retired...in the company!". Apart from the *Consultancy Firm* and the *Professional Services Partnership* (discussed below) if anything employers wanted to

retain, not shed, older workers. The Head of Performance & Reward of the *Major Defence* contractor argued that with the skill set of the people they employed, experience was hugely valuable and: *"*Quite a lot of our people, we probably won't want to retire." This was echoed by the Head of Benefits of the *Multi-National Energy Company* : "I'm of the view that says actually we are going to want people to work longer than we have in the past. More generally however, in a world where people moved frequently between employers, this was simply not seen as a business problem to think about. As the CEO of the *Fashion Agency* put it: "people stay in a company for 3, 4 years, they don't stay in a company for …so this aging workforce...doesn't mean anything."

There were two exceptions. The Partner of the *Consultancy Firm* very firmly said that an important part of the design of their (generous) pension was "to enable us to… quite frankly to be able to separate from long serving employees when they are in a position financially and capable to be able to do it, rather than doing it on the basis of capability. That's an important commercial aspect to the design". The other exception was the *Professional Services Partnership,* discussed below.

The exception that proves the rule: The *Professional Services Partnership* offered a very unusual 'pension'[62] plan to its (highly rewarded) partners, and was the only firm of the 15 interviewed that viewed their 'pension' as having a number of valuable supply side advantages for the organisation. This was largely because the 'pension' was not legally regulated as such, and so they had considerable discretion over the circumstances in which it could be paid out.

The 'pension' was offered to partners only and was a notional (unfunded) scheme. Partners 'put' 7% of their profits into a notional fund. This 'fund' had a growth rate of the retail price index (RPI) applied to it. When partners came to retire (at the later of age 55 or retirement date) they could then choose what period to spread this amount over. For example, if a partner had £1,000,000 in their notional fund, they could take £200,000 for 5 years or £100,000 for 10. The money in payment would increase each year by RPI. This plan, which was obviously quite attractive for the individual, came with many of the

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[62] Arguably this should not be included in this discussion, as technically this is not a regulated pension. However, the Head of Partner Affairs interviewed, clearly regarded it as such (it was about 20 minutes into the interview before he explained that it was not a regulated pension, and was called an early retirement allowance). It has been included as it offers an example of how employers can (and historically did) use deferred pay as a management tool.

supply side benefits that were associated with DB pensions of the early/mid 20th century, when occupational pensions were far less regulated.

One of the original rationales for this pension (which was originally called an 'early retirement allowance') was to enable the firm to 'move on' partners, whom the firm might want to encourage to leave, and the pension was a safety net to smooth the way. The design had clearly evolved over the years, and the Head of Partner Affairs saw it as having a number of real advantages. As the fund was notional (i.e. there was no real pot of investments put safely aside), if the organization went, the money went with it. In the Head of Partner Affairs' words: "that is really good from our perspective, because what happens is, when people are leaving and certainly coming up to leaving and after they have left, they still have a vested interest in the firm. In other words, they will want to leave on good terms. They will want to make sure succession planning is in place." The plan also came with vesting rules; if you left within 5 years of being made partner, you lost all the money you had contributed, thus helping retain valuable employees. It also came with what the Head of Partner Affairs described as the 'nuclear option': There was a provision in the partnership agreement that allowed the pension to be withheld if you did something detrimental to the firm. While he pointed out that it had never, in practice, been used in this way, he thought this was a useful tool: "If you went to go and work for a competitor, you can't start—you can't go to XXXX and start selling stuff to one of your clients. But sometimes people will do that. They will try and do that and say, well, sue me then. Having that pension pot there is our nuclear option to say, okay, you are in breach of your restrictions and we are not going to pay your pension". It was also a very tax advantageous way to reward people. As it was not regulated as a pension it was outside the lifetime allowance.

The final advantage to the firm was that they had (unlike traditional DB schemes) put a cap on future liabilities. Notwithstanding the promise to pay this notional accumulation, they had a clause in their partnership agreement that said that if total pension liabilities exceed a certain percentage then "it allows us to say well, actually, we can't afford to pay any more this year. We would be writing to pensioners to say, sorry, you are not going to get it." As the Head of Partner Affairs said: "I am struggling to see anything that's better".

To summarise, only one of the fifteen firms interviewed saw any compelling supply side reasons to pay in the form of a pension, and that was almost completely because the pension was not regulated as such, and so gave the firm considerable

flexibility over how to use it. For the rest of the firms, there were either no supply side reasons, or very few. Employee demand (or the lack of) was seen as the primary reason for occupational pensions.

5.5.2 Demand Side Reasons

Few of the firms interviewed volunteered strong employee demand as the reason for their pension design. Only two companies, the *Data and Communication Business* and the *Consultancy Firm* gave employee demand as a factor behind their pension policy. Both of these firms had highly paid, highly skilled staff. Most individuals interviewed had strongly negative views about the extent to which employees valued a pension. The CEO of the *Fashion Agency* put it the most strongly: "never, ever have I had a discussion with a prospective employee and pensions been on the top, it just doesn't register." And again "there is no demand for it. There are other benefits that I think people prize more: basic salary; then bonus; holidays is an important one, number of days; and then things like clothing allowance, gym membership. All of these things fall well ahead of pensions". This perspective was echoed with varying degrees of strength by seven out of fifteen of those interviewed: The *Fashion PR* ("it's probably bottom of the list in terms of all the other benefits"), the *Architects* ("most people don't ask"), the *Large Clothing Retailer* ("I would guarantee you, if I went out there now and said, do you know how much [we] contribute to your pension, they would look at me blankly"), the *Large Restaurant Group* ("almost irrelevant"), and the *Small Training Firm* all felt that the pension offer was of little importance to their employees. These were predominantly (but not exclusively) firms that were reliant on a lower paid, less educated workforce. Even the *Multi-National Energy Company*, which had a relatively highly educated and highly paid work force, was negative. When asked how important the current DC pension was in attracting people, the Head of Benefits replied: "I think the answer is probably not very, I mean I take that a little bit by how often do I get to speak to a potential recruit, you know at a high level, about pension. The answer is just about never."

Five of the firms gave a more nuanced perspective: While the *Major Defence Contractor* thought that the pension offer was not a huge attraction for graduates and apprentices, he did say that for more mature hires it was showing some signs of being attractive when they were recruiting. This pattern of demand (low or non-existent for the young or low skilled, but more of an issue for older better paid employees) was echoed by the *Consultancy Firm*, *The Independent TV Company,* and *The Mortgage Brokers.*

The *Large Manchester based Retailer* presented a more complex picture of employee demand. Their former Head of Pensions strongly thought that the employees did appreciate a pension, but the (sad) history of their pension plan made clear that employees had little understanding of the vastly different values of different pension schemes. An old family business, they had had a DB plan for many years that offered a final salary scheme with accrual rates of 1/60th with an employee contribution of 6%. Despite the generosity of this scheme, only 40% of employees had elected to join. With the advent of auto enrolment, the new generation of owners decided that it would be too expensive to enrol everyone into this scheme, so it was closed to new members, and all new joiners were auto enrolled at the government minimums into NEST[63]. In the words of the former Head of Pensions: "the new guard...came in, and so although they wanted to be paternal, they felt at that point, the new generation, that pensions weren't quite as important. I'm not convinced that that was necessarily true, because when we auto enrolled people a lot of people said, oh I am glad I've got a pension now, even though they had been able to join the DB scheme, and they didn't, it was inertia, and they were glad when they went into a pension scheme, and I don't think they probably realised how little they were effectively getting" (pulling a face). In sum, employees valued *a* pension, they just were unable to fully understand the very different values associated with different pensions.

The Head of Benefits of the *Multi-National Energy Company* gave another example of the difficulty employees have in accurately valuing a pension. They had also closed their (very generous non-contributory final salary) DB pension to new entrants, and replaced it with a 15% benefits amount that could be used for pension, other benefits such as private medical insurance, or taken as cash. In his words: "we did some really formal benchmarking a while ago within reward to say are we actually having to pay higher salaries to people than we used to in order to attract them and the answer appeared to be no".

In summary, many employers saw no evidence at all of employee demand for a pension. Where employees did think that their employees valued a pension, this tended to vary by age and seniority, and there was evidence that while some people valued 'a'

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[63] The National Employment Savings Trust (NEST) is a defined contribution workplace pension scheme set up by the UK government to facilitate automatic enrolment.

pension, this did not necessarily equate into understanding the real value associated with different pension schemes.

This leads to the issue of *why* employers felt that employee demand for a pension is low? There were three main factors mentioned in the economic literature as to why employees might prefer an occupational pension (rather than pay): (i) for the tax benefits, (ii) if there were differences in risk preferences between employer and employee and (iii) if there were differences in the transaction costs incurred by the employee and employer. From a behavioural economic perspective, (iv) bounded rationality and (v) bounded self-control are other key factors that would also impact on demand. These themes are discussed in turn.

Tax: A large proportion of firms thought that their employees did not understand the tax benefits to pension saving. This might be slightly distressing for a government that spends over £41 billion[64] a year on those tax breaks. The overall opinion was neatly summarised by the CEO of the *Fashion Agency*. When asked if he thought employees understood the tax benefits of saving, he replied: "Some might do, the sophisticated ones, some on the very high salaries that are financially more articulate. Older people, maybe, people over 40 would understand. But I think most of the workforce, you know the millennials, absolutely not, and don't care". For those employers where the bulk of the workforce was lower paid the answer was an even more resounding no. In the words of the Director of the *Architects*: "No, I don't even understand the tax benefits". Finally, the Head of Benefits for the *Multi-National Energy Company* was far from convinced that the tax breaks associated with pensions were as strong an incentive as they were sometimes presented to be: "I would probably argue that in a DC scheme the tax advantages are probably not as big as people say, I mean obviously you have got the tax-free lump sum, that's a clear advantage and potentially you have got tax band shifting. But again, for our work force, that's maybe a less...you have got a lot of those who probably still will be higher rate tax payers after retirement". To summarise, the interviews indicated that few firms felt that their employees understood the tax benefits to saving in a pension. And it

[64] Based on ONS figures for 2016 – 17: Total relief on income tax: 38,600 million, plus total relief on NI: £16,200 million, less tax liable on pensions in payment: £13,500 million. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/683943/PEN6__2007-08_to_2016-17___for_publication.pdf

was those employees that are most at risk of under saving (i.e. the lower paid) who were least aware of the tax breaks.

Risk and transaction costs: Neither of these issues were raised in the interviews. The ability of a pension to exploit differences in risk preferences is primarily an advantage of DB pensions, so it was not surprising that no one mentioned this as a reason. There was also no mention of transaction costs. An economist might argue that this was not mentioned as the pensions market has evolved such that individuals are now able to access pension investments privately at very low costs. More realistically it might have been ignored as an issue as almost everyone, bar experts, is unaware of the impact that seemingly small differences in transaction costs can have on ultimate investment returns. The reasons that most employers gave for an employee lack of demand were bounded rationality, and to a lesser degree, bounded self-control. These are discussed next.

5.5.3 Bounded Rationality

Unsurprisingly, information problems were a strong theme in the results. Nearly all of the firms that offered a pension set at auto enrolment minimums[65] (seven out of the fifteen interviewed) explicitly discussed information problems as a reason for low employee demand (and consequently why they only offered the legal minimum). In the words of the HR Director of the *Large Clothing Retailer*: "you talk about pensions to anybody here. And they do, their eyes glaze over, because it's just a case of, they feel that it is too complicated so they don't even want to enter into it". Or as the CEO of the *Fashion PR* put it: "I think that a lot of the information is given in such a jargon laden way, that they sort of glaze over". This theme was not just restricted to the firms that offered minimal pension provision. The Director of the *Architects* (who unusually for such a small firm had always offered a reasonable pension[66]) said that: "most people don't necessarily see the value in it, or that it's growing, they don't know where it goes…what it's doing for them".

The interviews (five[67]) where information problems were not brought up as a strong theme all offered more generous pensions, and most of them also offered assistance to their

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[65] The following firms offered occupational pensions at, or very close to, auto enrolment minimums: *Fashion Agency, Fashion PR, Large Clothing Retailer, Large Restaurant Group, Mortgage Brokers, Large Manchester Based Retailer, and Small Training Firm.*

[66] They had always offered a 5% employer match for a 3% employee contribution.

[67] The *Major Defence Contractor*, *Independent TV Company*, *Challenger Bank*, *Mortgage Brokers* and the *Multi-National Energy Company.*

employees to help them understand pensions: To cite the HR of the *Challenger Bank*: "yes, it's great to give a pension but actually you need to educate people for them to fully appreciate the value of what it is that they have got". For example it was typical in this group to give people access to a 1:1 appointment with a financial advisor when joining or on request.

It was probably no accident that only those firms that offered better pensions provided their employees with any financial guidance. The Founder of the *Small Training Firm*, when asked if they provided any financial education around pensions, said no: "Probably because it's not in our interests at the moment to push it, educating too much, because I don't think it's good enough at the moment to push". And (even as a former accountant with PWC) he admitted "I think that, there is not enough financial education around pensions. I think it's too hard to access, even now, I just about understand it".

To give the final words to the Founder of the *Small Training Firm*: "We are really failing. We are really failing. It just seems to kind of like, those that...need the pension the most, are those that often don't understand it enough".

5.5.4 Bounded Self-Control

The classic justification for a lack of interest in pension saving is our lack of self-control. As the traditional fable by Aesop puts it, the lazy grasshopper prefers to laze around in the sunshine, while the industrious ant works hard to prepare for winter. However, a lack of self-control was not as strong a theme as one might have expected.

Six[68] of the interviewees did bring up bounded self-control as a justification of their pension design: As the CEO of the *Fashion Agency* put it: "Employees don't understand what it's for, and they don't really care because it such a long way out". And this sentiment was repeated by others. The Head of People of the *Large Restaurant Group* did not explicitly discuss a lack of self-control, as clearly for his employees the pension did not even enter into their consciousness as something over which to exercise control: "I just don't think that it's even on their radar". However, a reluctance to think about the future was often mentioned in the context of a lack of affordability. The *Finance Director,* who was present in the interview at the *Fashion PR* raised the issue: "London is so expensive to

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[68] The *Fashion Agency*, *Fashion PR*, *Architects*, *Large Clothing Retailer*, *Large Restaurant Group*, and the *Small Training Firm.*

live in, they need every penny they can to survive, cos you hear them, living on scraps. We'll have….a leaving do, and they've got cheese spread [leftover]…. and the younger people will put that in the fridge and eat it for the next two days for their lunches to save a few quid, you know?". The HR Director of the *Large Clothing Retailer*, and the Ex Head of Pensions of the *Large Manchester Based Retailer* echoed this: "at the most junior level and at our youngest level it is something that they then struggle with a little bit in terms of cost."

Others talked not so much of a problem of affordability, but rather of other, more pressing financial priorities. For example, the Partner of the *Consultancy Firm* said: "So our youngsters coming out of university at 22 years old…this generation they have clocked up significant student debt, and they are desperate to get on the housing ladder and move on in life, and saving for a pension is not their top priority". Or in the words of the *Multi-National Energy Company*, "I think we have to accept that, particularly our younger employees, have other challenges…should their priorities be saving for a pension, should it be saving for property, should it be paying off student debt, should it be paying off credit cards debt if they have got it". This sentiment was also echoed by the *Major Defence Contractor.*

To summarise bounded self-control was raised as an issue which made offering pensions less relevant, but it was not as strong a theme as one might have predicted. It is very easy to characterise under saving as imprudence. However, one needs to be careful to separate out financial impatience from a genuine lack of affordability, or other more pressing financial priorities.

5.5.5 Choice and Flexibility

The final key theme that emerged from the interviews, that was not anticipated by the literature, was of the importance of offering choice in an occupational pension design. When asked to describe the rationale behind the firm's pension design, the Partner of the *Consultancy Firm* named three core ambitions: "we wanted one size fits all (for consistency), we wanted member choice, we wanted it to be distinctive in the market". This focus on member choice was shared by the Head of Performance & Reward of the *Major Defence Contractor* and the Head of Benefits of the *Multi-National Energy Company,* and was mentioned by three other firms *(*the *Large Clothing Retailer,* the *Challenger Bank* and the *Data and Communication Business).* They shared the same logic. The Head of Performance & Reward of the *Major Defence Contractor* described it

as a "philosophy that I feel quite strongly about...different people, at different stages of life, or different personal circumstances regardless of the states of life, have different needs around or different ability to save…The days of me, as an employer hiring you, and saying whether you are 21 or 51, male or female, single, family of ten or whatever, I know what's best for you and it's this employment package and it's x, y and z, take it or leave it. We are now able to say, okay…the person knows best what your needs are is you. Within reason, here is a package, flex it as you see fit". The Head of Benefits of the *Multi-National Energy Company* said almost the same: "I think it was a whole question of just trying to give people the freedom to use the money as they wish and recognising that for some people pension would not be all-important". The *Consultancy Firm* said "I think we just have to balance and respect that people have different needs at different times in their life cycle...so why would we force them to save 8% of their pay into a pension scheme, even though we would match it with 12, that would alienate them. That would seriously impact on our ability to recruit, so we give them the flexibility." The Head of HR of the *Data & Communication Business* (a firm with a highly paid and skilled young workforce) discussed her desire to do a scaled matched contribution at some point in the future as a way to target pensions to those who appreciate them: "we are a great place to work and sometimes because we hire graduates who know nothing different, they take that for granted, and so I almost would want to do it, the pension thing, as like, if they are really serious people, and the people who really get it, we are happy to contribute more, but the people who are: oh it's just a pension, whatever, they stay on the 2%".[69]

Every firm that offered a generous pension contribution (i.e. those who offered 12% or more) used a design that offered flexible levels, so employees who valued a pension could get high contributions, and those for whom it was less of a priority (as evidenced by the extent to which they were prepared to give up pay) would get a correspondingly lower contribution. In contrast to a traditional DB plan where the choice was in or out (and usually required a relatively modest employee contribution) this is a rational way for the employer to target pension spending at those who most value it. However it is likely to have equity implications, those who are lower paid and less financially literate are likely to build up inadequate private savings.

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[69] The pension scheme for the regular staff of the *Professional Services Partnership* also offered a matched pension offer very similar to the ones described here, although the logic behind the design was not discussed.

5.6 Summary of Results

5.6.1 Economic Supply Side

The majority of firms saw no supply side reasons at all to provide a pension. The only benefit that that was mentioned more than once, was the idea that a pension sent a message or signal about the firm. This was mentioned by five firms, all of whom employed a more skilled workforce. The exception that proved the rule was the 'pension' plan offered to partners of the *Professional Services Firm*, which illustrates how deferred pay can be used as a management tool.

5.6.2 Economic Demand Side

There was a mixed pattern. For firms with a younger, less skilled workforce, employee demand for a pension was regarded as non-existent by the employers. For employers that had more highly educated, older employees, the evidence was more nuanced.

5.6.3 Bounded Rationality and Bounded Self-Control

Bounded rationality was a strong theme, but again it was employers with a younger, less skilled workforce who were more likely to mention it as a rationale for their pension (or lack of). Bounded self-control, perhaps surprisingly, was a less strong theme. The issue of a lack of affordability, or different financial priorities, was mentioned as much as the lack of self-discipline.

5.6.4 Choice and Flexibility

Employee demand was seen as the primary reason to provide an occupational pension. About half of those interviewed thought pensions were irrelevant to their employees, and so provided only the legal minimums. Others saw variable levels of demand for pensions from their employees, and one common response was to design a pension scheme that offered considerable choice and flexibility. Put crudely this forced employees to put their money where their mouth was: the more they were prepared to give up salary, the more their employer was prepared to contribute.

5.7 Discussion

This chapter asked why a rational, profit-seeking, employer would choose to provide an occupational pension in excess of the minimum level laid down in law? Employers in the UK have a considerable degree of choice in the design of their occupational pensions, this research sought to uncover the logic behind that choice.

It advanced three propositions:

Proposition 1: There are no supply side benefits to the firm in providing defined contribution occupational pensions.

Proposition 2: Employees undervalue occupational pensions because of bounded rationality and bounded self-control.

Proposition 3: As a consequence of proposition 2, firms will respond to reduced demand either by offering the minimum level of pension provision required by the state, or by offering flexible pension benefits to target spending at those employees who place the highest value on a pension.

Proposition 1 was strongly supported. The only supply side reason for providing an occupational pension (cited by five of those interviewed) was the signal that a better than minimum pension sent about the nature of the firm. Consequently, for most firms the only reason to provide an occupational pension (over and above the minimum mandated by the state) is employee demand.

Proposition 2 had mixed support. While there was clear support for the proposition that many employees undervalue a pension (compared to the cost to the firm of providing it) this was not universal. For small firms, or firms operating in labour markets where employees are low skilled and low paid, proposition 2 was strongly supported. In general, these employers saw no demand side reasons to supply a pension. For the largest firms operating in labour markets where employees are skilled and more highly paid, the proposition had mixed support. Firms saw mixed demand.

Proposition 3 was supported. There were two key responses to low or mixed employee demand for a pension. Either firms offered the minimum they could in law, or where firms offered a more generous pension contribution they had in all cases designed pension schemes that offered considerable choice and flexibility, enabling them to target pension money efficiently at those employees who valued it most.

These results chime with the Dual Labour Market Hypothesis (Doeringer & Piore, 1975), according to which there are two kinds of labour market. One is characterised by good jobs, low quit rates and good working conditions; the other the reverse. The former

has wages (and pensions) above market clearing; the latter pays equilibrium wages (and pensions).

What are the implications of these results? The UK state currently provides a flat-rate state pension which is just enough to keep you out of poverty[70]. Occupational pension saving is expected to bridge the gap between needs and aspirations in retirement. While auto enrolment is forcing employers to nudge employees into occupational pensions, the amounts saved are low. Contributions are set to rise to a total of 8% by 2019, but this is only on earnings between £5,876 and £45,000, and is only triggered once you earn £10,000 per annum. If profit-seeking employers see no supply side reasons to provide pensions, and employee demand as either non-existent or inconsistent, then a public policy that relies on private companies to make up the gap between needs and aspirations is likely to have inconsistent results. Those employees who work in low paid and less skilled jobs, or for smaller firms, are likely to have only minimal occupational pensions. The lucky ones, who work in the largest firms, with a higher paid and more skilled workforce, are likely to be offered more generous pension provision (as long as they are prepared to pay in themselves to get the higher contribution level).

5.8 Limitations

As Yin (2013) notes, in general good research design needs to maximize construct validity, internal and external validity, and reliability. In relation to this project more specifically the following limitations should be noted. When asked about the logic of their pension design there was clearly a temptation for the interviewee to impose a rationality onto the situation that might in reality be a reflection more of accident than design. Similarly, it is difficult for the interviewer not to lead the conversation down predetermined paths. While this research started with a set of preliminary propositions about the potential logic behind pension design, an effort was made to keep the questions open, and not be too leading. All conversations were recorded, and full transcripts were made to enable careful coding (full copies of the transcripts have not been included in the appendix to protect confidentiality but can be provided on request). A very careful set of notes was kept, to log the references to each key theme and subtheme to prevent unconscious bias. Fifteen case studies were

[70] For those with a full record of National Insurance contributions.

used, and this number was chosen as it was felt that data saturation had been reached, however it is possible that wider sampling would uncover a different picture.

5.9 Conclusion

The overarching question of this thesis is how much choice should we have when it comes to our pensions? The current UK pension system, compared to the continent, still allows a considerable degree of choice to employers over how generous they can be with their pension. The evidence of this chapter is that very few employers see supply side reasons to provide a pension. In consequence employee demand for a pension is crucial. Due to bounded rationality and bounded self-control many employers perceived employee demand for pensions to be low. Barr (2004) has argued that if buyers don't understand the price or quality of a good, then the market for it will not be efficient. In this context if employees, due to bounded rationality or bounded self-control, undervalue an occupational pension, it should be no surprise if profit-seeking employers will be disinclined to offer one.

Table 4.1 Summary of results interviewee 1 – 8

Data category	Data code	Interviewee							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Role		Partner	CEO	CEO	Director	Head of Performance and Reward	HR Director	Head of People	CEO
		Consultancy Firm	Fashion Agency	Fashion PR	Architects	Major Defence Contractor	Large Clothing Retailer	Large Restaurant Group	Independent TV company
Company size	No UK employees	14,500	300	28	26	5000	1,100	2,300	480
Supply side themes									
Any supply side reasons given for pension	Yes No Not Mentioned (NM)	Yes	No	No	No	Yes	No	No	Yes
Do pensions reduce turnover	Yes No Mixed (M) No mention (NM)	M (important for those at mid- top end career level)	NM	NM	NM	No	No	N	See note[4]
Do pensions increase productivity (incentive)	No Not mention (NM)	NM	NM	NM	NM	No	NM	No	NM
Sorting	Mentioned (M)	-	-	M (but not for pensions)	-	-	M (but not for pensions)	M (but not for pensions)	-
Gift exchange (is pension used to send positive message)	Yes No No mention (NM)	NM	NM	Yes	NM	Yes	NM	NM	Yes

Pensions as a way to time retirement	Yes No Not mentioned (NM)	Yes (given as main rationale)	No	No	NM	No	NM	NM	NM
Demand side themes									
How important is pension to employees	Positive demand (P) Negative demand (N) Mixed demand(M)	M (Demand from older more experienced hires, not from young)	N	N	N	M	N	N	M (Demand from more senior people)
Do employees understand tax Benefits of pensions?	Yes No Mixed (M)	-	M	No	No	M	Yes	No	Yes
Risk sharing	Mentioned (M) Not mentioned (NM)	NM	NM	NM	NM	M	NM	NM	NM
Transaction costs	Mentioned (M) Not mentioned (NM)	NM	NM	NM	NM	M	NM	NM	NM
Behavioural economic (i.e. reasons for low demand)									
Bounded self-control ('living for today' given as justification for pension design)	Mentioned (M) Not mentioned (NM) Mixed evidence (ME)	NM (mentioned different financial priorities for young)	M	M (but also mentioned affordability- 'they need every penny')	M	ME	M (but also mentioned 'they struggle a bit with cost')	M	NM
Bounded rationality (lack of understanding	Mentioned (M) Not mentioned (NM)	ME	M	M	M	NM	M	M	NM

given as justification for pension design)	Mixed evidence (ME)								
Emergent themes									
Choice and flexibility	Part of pension logic (PL) Not part of pension logic (NPL)	PL	NPL	NPL	NPL	PL	NPL (but did mention it as an aim)	NPL	

Summary of results interviewee 9 - 15

Data category	Data code	Interviewee							
		9	**10**	**11**	**12**	**13**	**14**	**15**	
Role		HR Manager	CFO	Head of HR	Head of Benefits	Ex Head of Pensions	Founder	Partner	
		Challenger Bank	Mortgage Brokers	Data & Communication Business	Multi-National Energy Company	Large Manchester based Retailer	Small Training Firm	Professional Services Partnership	
Company size	No UK employees	700	60	90	14,000	4,700	16	18,000 (900 partners)	
Supply side themes									
Any supply side reasons given for pension	Yes No Not Mentioned (NM)	Yes	No	Yes	No	No	No	Yes	
Do pensions reduce turnover	Yes No Mixed (M) No mention (NM)	No	No	No	No	No	NM	Yes	
Do pensions increase productivity (incentive)	No mention (NM) Yes	NM	NM	NM	NM	No	NM	Yes	
Sorting	Mentioned (M)	-	-	-	M (not relevant DC)[3]	M (not relevant DC)	M (but not for pensions)[4]	NM	
Gift exchange	Yes (Y) No (N)	Yes	No	Yes	NM	No	(mentioned in context	NM	

(is pension used to send positive message)	No mention (NM)						of fact he thought his pension sent bad signal)		
Pensions as a way to time retirement	Yes No Not mentioned (NM)	No	No	No	No	No	NM	Yes	
Demand side themes									
How important is pension to employees	Positive demand (P) Negative demand (N) Mixed demand (M)	P (especially for older people)	M	P	N	M[1]	N	N/A[2]	
Do employees understand tax Benefits of pensions?	Yes No Mixed (M)	No	Yes	No	M	No	No	N/A	
Risk sharing	Not mentioned (NM)	NM	NM	NM	NM	NM	NM	N/A	
Transaction costs	Mentioned (M) Not mentioned (NM)	NM	NM	NM	NM	NM	NM	NM	
Behavioural economic									
Bounded self-control ('living for today' given as justification for pension design)	Mentioned (M) Not mentioned (NM) Mixed evidence (ME)	NM	NM	NM	NM	ME	M	N/A	
Bounded rationality	Mentioned (M) Not mentioned (NM)	NM	NM	M	NM	M	M	N/A	

(lack of understanding given as justification for pension design)	Mixed evidence (ME)								
Emergent themes									
Choice and flexibility	Part of pension logic (PL) Not part of pension logic (NPL)	NPL But did mention thinking about introducing flexible benefits	NPL	NPL But did discuss flexible benefits as way of targeting pension at those who value it.	PL	NPL	NPL	N/A	

6 Experiment 1: The Invisible Reward

> *'One of the most striking features of the 'price' of labour is its sheer complexity. It is not a single price for a piece of work, but rather a complex schedule of prices.' (Marsden, 1999 p.178).*

6.1 Introduction

The next three chapters consider the question of pension choice from the perspective of the individual. This chapter reports the results of an experiment that looked at the impact that an occupational pension has on perceptions of how attractive a job is (when there is a trade-off between better pay now or a better pension later). Chapter 7 looks at the impact of three different educational nudges on attitudes to pensions. Chapter 8 repeats the experiment in chapter 7 with an older demographic, whom, a priori, one might expect to be more concerned about their pension.

Much previous research on pension decision-making has focused on the pension choice in isolation: if left to their own devices do people fall prey to the common behavioural biases and save less for their retirement than their future selves would like? This chapter recasts the issue of whether people are saving 'enough' for their retirement by looking at the job choice itself. Arguably your job choice (whether you choose a job with a 'good' pension or not) will potentially have a much larger impact on your later financial health than the isolated decision to save a few percent more or less.

Beyond the costs to the individual, why does it matter that employees may undervalue an occupational pension when making employment choices? Akerlof, in his seminal article "The Market for Lemons: Quality Uncertainty and the Market Mechanism" (1970), introduced the problem of asymmetric information in the used car market. Here Akerlof showed how, in a market with information problems where buyers are unable to distinguish the quality of goods, the market for this product will degrade. The example he gave was of the used car market, with two types of cars – a 'peach' and a 'lemon'. If buyers are unable to tell the difference they will only be willing to pay the average of the cost of a 'lemon' and a 'peach'. If the sellers can tell the difference, at this price they will only be prepared to sell the lemons (and will leave the market if they hold 'peaches'). It is suggested here that the problem of asymmetric information is also applicable to the

pension market. As Lazear (1985) points out, in a competitive market, payments that take the form of a pension must be offset by a decrease in the wage rate. This is the result of the firms zero profit constraint: total payments to the worker must equal total output by the worker.[71] So, while a progressive employer may be happy to offer a good pension, and employees would like to work for companies with good pensions, if most employees are unable to tell the difference between the value of the pensions offered when they take a job (while employers are well aware of the costs of providing a pension), in the absence of regulation or powerful unions, the market for pensions will be left to 'lemons'. As Hills (2007) notes, why would employers offer an expensive (and potentially very risky) benefit that does not appear to be valued by potential workers?

The previous chapter showed that many employers believed that the pension offer was almost irrelevant to employees when they were making their job choice. This chapter considers this question experimentally, from the employee perspective. It looks at the results of a study that tested: (i) the impact that a pension of varying generosity had on the perception of the attractiveness of the job, and perceptions of company culture; (ii) the extent to which different groups of people might be more or less inclined to find a job package that favours a pension more attractive; (iii) whether the framing of the company's pension plan - in terms of promotion versus prevention frames - had an impact on the perception of the attractiveness of the job or company culture.

This chapter proceeds as follows. First the theoretical framework is discussed, which gives rise to the three research questions. Next the study and the method are outlined, and the use of the experimental method is justified. The results are reported as they apply to the three research questions. The discussion follows, with a brief conclusion. The limitations of the experimental method are outlined at the end of chapter 8.

6.2 Theoretical Framework

As the preceding chapter noted, there are two principal perspectives taken on why employers will provide pensions: the demand side and the supply side (McCarthy, 2006).

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[71] Lazear (1985) further notes that the way in which the worker perceives that his wage is affected by his pension is important and that there is no obvious reason why a firm does not make the worker explicitly aware of the true relationship between pension and wages. He further argues that one main difference between a defined contribution and a defined benefit scheme is that the former makes much clearer the link between wages and pension, and thus tends to induce an efficient allocation of resources.

From the demand side perspective employers will provide a pension if (due to market imperfections) employees prefer to receive deferred pay as part of their contract. This is the focus of the first research question.

There are also supply side benefits, which affect how employers view the total cost of paying for a pension. Pensions may cause people to stay longer at the firm than they otherwise would, they may give employees an incentive to work harder, they may attract a different type of worker. This argues that employers favour pensions because they can help to raise workforce productivity and lower labour costs. These two perspectives (demand and supply) are not mutually exclusive. One can believe that the principal purpose of pensions is to respond to workers demand for tax favoured saving for retirement, while also recognising that employers may benefit from these incentives. Consequently, the second research question looks at the question of whether a job package that favours a pension may appeal more to a different type of worker.

A large body of research in the field of psychology argues that individuals who are able to delay gratification achieve higher levels of success. Mischel and Ebbesen argue that the "ability to sustain self-imposed delay for the sake of larger but delayed consequences appears to be a chief component of most complex higher order human behaviour" (1970 p.330). Their research showed that those children who were better able to delay, later on tended to have better life outcomes[72]. More recently Duckworth et al.'s (2007) research has also focused on two traits that they argue predict achievement: grit and self-control. Grit is the tendency to sustain interest in and effort toward very long-term goals. Self-control is the voluntary regulation of impulses in the presence of momentarily gratifying temptations (Duckworth & Seligman, 2005; Duckworth & Steinberg, 2015).

In a recent example of the impact of sorting effects Ashraf et al. (2015) conducted a study in association with the Government of Zambia that looked at the impact of varying the salience of different career incentives when recruiting health workers. In one area of Zambia the recruitment poster emphasised career progression incentives, in the control area the recruitment posters emphasised the benefits to the community. They found that emphasising career progression attracted workers that were substantially more effective in

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[72] However, while the ability to defer has been conceptualised as a desirable and stable personality trait, as Mischel & Ebbesen caution, it is inappropriate to conceptualize delay of gratification as if it hinged on an 'all-or none' ability. For example, they note that the ability to delay depends on the individual's expectation or trust that he will really get the delayed but more valuable reward.

the field. While some of the performance gap was due to observable characteristics (i.e. higher skills when measured by tests) a large part of the performance gap was due to unobservable traits that made them more productive. They argue that this makes the case for focussing on the selection effects of recruitment as a tool for improving organisational performance.

Finally, the third research question asks whether the framing of the company's pension plan has an impact on perception of the attractiveness of the job. As has been consistently pointed out in the behavioural economics literature, the way in which a choice is framed can have a very powerful impact on the choices people make. Numerous examples have demonstrated that the preferences of decision makers can be reversed based on what should rationally be considered irrelevant information (Kahneman & Tversky, 1979). This experiment draws on Regulatory Focus theory, Higgins (1997), to look at whether the framing of the company's pension plan - in terms of promotion versus prevention frames - has an impact on the perception of the attractiveness of the job or company culture. In Regulatory Focus theory, Higgins distinguishes between the two different ways in which we can reach our desired end state, which Higgins refers to as a 'promotion focus' or a 'prevention focus'. A promotion focus emphasises hopes, accomplishments and aspirations, and avoiding 'non gains'. In contrast a prevention focus emphasises security, safety and 'oughts', and avoiding losses. Regulatory focus can differ across individuals (i.e. we may each have a preferred approach in that we have a tendency toward a promotion focus or prevention focus), it can differ across situations. It can also be primed or induced.

In sum this study asks three related questions. First, from the demand perspective, is a more generous pension something that attracts potential workers? Second, from the supply side perspective, does a job package that favours a pension disproportionately appeal to a different type of worker? Finally, what impact does the framing of the pension have?

6.3 Research Questions

(i) Does providing a larger amount of a (roughly equivalent) total compensation package as pension, affect perceptions of the attractiveness of a job, and perceptions of company culture?

(ii) Does varying the salience of a pension at the recruitment stage attract a different type of worker?

(iii) Does framing a company's pension plan in terms of promotion versus prevention affect perceptions of attractiveness of a job and perceptions of company culture?

6.4 Study Description

The objective of this study was to test whether the level of pension offered in a job advertisement, as well as how this pension was framed, impacted the attractiveness of a job and the perceptions people form of company culture. In addition, it measured whether this manipulation of the salience of different career incentives (pay versus pension) at the recruitment stage attracts a different type of worker. Put simply, do job advertisements that highlight a pension seem more (or less) desirable to job seekers, and do they attract a different type of worker?

The experimental method was chosen for this part of the research. Experiments can be a very effective way of testing research questions that would be hard, if not impossible, to do in real life. Experiments are good at testing causal theories (Leik, 1997), one is able to induce variation to test a theory, and eliminate or reduce unwanted sources of variation. In the real world, it can be hard (and perhaps unethical) to persuade individuals and organisations to be part of a genuine randomised trial (Levitt & List, 2009).

In line with LSE's research ethics procedures, a research ethics review was completed for the studies in chapter 6 and 7 and was submitted to the Department of Management for approval. The data collected was anonymised when it was collected through Prolific in line with their privacy policy and was stored in a password protected Dropbox account. The research for the studies in chapter 6 and 7 was funded through a grant from the Economic and Social Research Council.

Participants were randomly allocated so that they saw one of six different versions of a job advertisement. These six advertisements varied along two different conditions. First was the level of pension versus pay offered by the company (referred to as pension condition). The total cost to the employer of the combination of pay and pension was kept roughly the same, in other words a higher pension contribution came with lower pay. The second manipulation was how this pension offer was framed (referred to as the regulatory condition) (see appendix B.1). Finally, the actual salary bands that individuals saw were customised to reflect their current stated earnings (see appendix B.2). Everything else in the job advertisement remained the same. For example, the 4% pension/ promotion framed job advertisement looked as figure 6.1 below. The dependent variables of interest were how interested participants were in the job advertised and their perceptions of company

culture. Participants were also measured on their financial knowledge, their level of 'grit' (Duckworth et al., 2007) as well as demographic measures such as educational achievement, income, age and gender.

Manager roles at W.D.M. Plc

Are you interested in a permanent full-time role at a respected company?

As part of the next phase of the company's development, we have a fantastic opportunity to join a busy and motivated team that will give the successful applicants a breadth of skills and experience in a fast-moving and challenging environment.

If you have strong communication and problem-solving skills, then this is the opportunity for you.

Our benefits package includes:

Salary of £26,000 - £32,000, depending on experience
Pension, to which we contribute a further 4% of your salary
25 days holiday entitlement
Subsidised staff canteen

We believe that it is important to think about the future. Included in our benefits package is our excellent pension which is designed to help you reach your goals for the future, and to make your retirement everything you dream of.

The successful candidate will be hard-working and have a desire to be successful. Please get in touch if you are interested in joining our team.

Figure 6-1 Example of job advertisement

6.5 Methods

Participants and Design

759 participants were recruited to an online survey through Prolific (see appendix B.3 for full survey). 41% of the sample was male, average age was 34, and 75% of the sample earned less than £30,000. Participants were told that they were taking part in a study about workplace culture and were paid £5 to complete the study. Pre-screening criteria were set to filter respondents so that only those who were over 18, resided in the UK and were either working full or part time, were unemployed or job seeking were accepted.

Respondents were randomly assigned into one cell of the 3 (pension condition: no pension/ 4% pension/ 10% pension) by 2 (regulatory condition: promotion/ prevention) design. An alpha level of 0.05 was used for all statistical tests.

Manipulation: Pension Condition

The first manipulation was the level of pension on offer. In one version of the job advertisement there was no mention of a pension at all, in the second version the job advertisement described a pension to which the employer contributed 4%. In the third version the job advertisement described a pension to which the employer contributed 10%.

The study was designed to keep the total cost of the reward package to the employer roughly the same. In other words, it was expecting potential employees to make a trade-off between higher pay now, and a better pension later. In consequence, the salary range in the first two pension conditions (no mention of pension and a mention of a 4% pension) were the same in both adverts, however the salary range in the 10% pension was slightly lower so that the total cost to the employer was held roughly equivalent (see appendix B.2 for full details). The rationale behind keeping the salary constant between the no pension condition, and the 4% pension condition, was that now all employers are obliged to auto enrol their employees into a workplace pension[73] no mention of a pension in a job advertisement implicitly means a job that will, at a minimum, come with a low employer pension contribution.

Manipulation: Regulatory Condition

In addition to varying the level of pension offered in the job advertisement, the framing of the benefits package was also varied to highlight either a prevention or promotion frame. The job advertisements where there was a 4% or 10% pension contribution were framed as follows (italics indicate wording that was changed between conditions):

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[73] At the time of the experiment all workers over 22 and below state pension age who currently earn more than £10,000 must be enrolled. There is a minimum that the employer must contribute, but the employer can decide to be more generous – for example offering non-contributory pension schemes.

- Currently the minimum is 1% for employee and 1% for employer on qualifying earnings between £5,772 and £41,856. For the employee this means after tax relief they contribute 0.8%
- From 2018: this will rise to 2% contribution from employer, 3% from employee (total = 5%)
- From 2019 this will rise to 3% from employer, 5% from employee (total = 8%). For the employee this means after tax relief they contribute 4%

- Promotion framing condition: "We believe that it is important to think about the future. Included in our benefits package is our excellent pension *which is designed to help you reach your goals for the future, and to make your retirement everything you dream of."*
- Prevention framing condition: "We believe that it is important to think about the future. Included in our benefits package is our excellent pension, *which is designed for your financial security, to take the anxiety from your retirement planning*."

Where there was no pension mentioned the wording was adjusted slightly to remove the mention of a pension, while retaining the promotion or prevention framing. In this case the two alternative frames read:

- Promotion framing condition: "We believe that it is important to think about the future. Our benefits package is designed *to help you reach your goals for the future, and to make your retirement everything you dream of."*
- Prevention framing condition: "We believe that it is important to think about the future. Our benefits package is designed *for your financial security, to take the anxiety from your retirement planning."*

Measures

Perceived Attractiveness of a Job

The first dependent variable of interest was the perceived attractiveness of a job. A scale ('*mean interest'*) was created from the mean score of the three answers that captured interest in the job ("I would be interested in taking this job", "I would be interested in working for this company" "…if you were looking for a job today how likely would you be to apply for this one"). These questions were measured on a scale of 1 – 5 (where 1 = strongly agree and 5 = strongly disagree) so that *lower* scores express higher interest in the job.

Perceptions of Culture

The second dependent variable of interest was the perception of company culture. Perceptions of culture were measured by asking respondents to indicate the extent to which they believed that various attributes were characteristic of the organisation in the job advert that they saw. Six items or attributes were used: '*Stability', 'predictability', 'being*

innovative', 'risk taking', 'being supportive' and 'opportunities for professional growth'. These were measured on a scale of 1 – 5 where 1 = not at all characteristic, and 5 = highly characteristic. Four of these were based on the Organisational Culture Profile developed by O'Reilly et al. (1991). In this profile O'Reilly et al. looked at the theories of vocational choice and the extent to which people are driven to select a career that fits with their own self-concept. In their research they looked for central values that were both important to an individual's self-concept as well as relevant to an organisation's central value system, and they found that two factors accounted for the most variance: Innovation and Stability. Two items, or characteristics loaded highly onto their factor for Stability '*stability*' and '*predictability*', and again two items loaded highly onto their factor for Innovation: '*Innovation*' and '*risk taking*'. In addition, the characteristic '*being supportive*' was included as there has been growing interest in the idea that firms should be supporting their employees' financial wellness[74]. Finally '*opportunities for professional growth*' was also included as an attribute as Montgomery & Ramus (2003) in a review of the literature on job choice, cite advancement opportunities (with pay and benefits) as one of the most important attributes affecting job choice.

In this study: 'Stability', 'predictability' and 'being supportive' were combined to create a single measure of 'perceptions of stability' and the three items: 'being innovative', 'risk taking' and 'opportunities for professional growth' were combined to create a single measure called 'perceptions of innovation'.

The Sorting Effect

The second research question asked if varying the salience of a pension at the recruitment stage attracts a different type of worker. Consequently, the third set of variables measured employee attributes that might plausibly be associated with a more desirable workforce. Worker attributes were measured in three ways: First, all respondents were asked for their highest educational level. Second the 'Grit Scale' (Duckworth et al., 2007) was used to measure grit and self-control. These two attributes (educational level and 'grit') could be regarded as observable characteristics, in that employers can observe them directly. As a less easily observable measure, a 'persistence task' was also included. This was

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[74] See for example: The Future of Financial Wellness conference proceedings September 30th, 2014. http://162.144.124.243/~longevl0/wp-content/uploads/2016/07/Proceedings-final-draft-12.31.pdf

attempting to capture a behavioural measure of grit and persistence that was less obviously observable. For this persistence task, all participants were asked for their help. They were told to email a randomly generated code to 'Rebecca Campbell who is a research student in the Management Department at LSE' and told they would be paid an additional bonus of £1 if they did so. However, they were not given Rebecca's email address. The hypothesis was that the act of tracking down the email address would capture 'grit' and could plausibly be associated with a preference for self-control and deferral.

6.6 Results

6.6.1 Perceived Attractiveness of a Job

Two of the central questions of this study were whether the mention of a pension in a job advertisement, as well as how the pension is framed, has an effect on the perceived desirability of the position. A scale, created from the mean score of three answers that captured interest in the job (Cronbach's alpha = .90), was used as the dependent variable in a two by three analysis of variance estimated using SPSS Generalized Linear model. A lower score represents *more* interest in the job.

Looking first at the main effects of the (i) pension condition and (ii) regulatory condition on 'interest in the job', no significant main effect was found for either.[75] The main effect of the pension condition on mean interest in the job was $F(2, 752) = 1.35$ $p = 0.26$ $\eta^2_{partial}$[76] = .004. There was also no significant main effect of the regulatory condition on mean interest in the job: $F(1, 752) = 0.58$ $p = .447$ $\eta^2_{partial} = 0.001$.

The estimated marginal means of 'interest in the job' were lower (which translates as more interest in the job) as the pension was increased. For example, the mean score of interest in the job was 2.301 in the job advertisement with no pension mentioned, and 2.175 in the 10% pension condition (i.e. the job came with a 10% pension). As 'interest in the job' was measured on a scale of 1 – 5, this translates into a difference of only 0.126 between the scores. Put in plain English people became very slightly more interested in the job, on average, as a higher pension was mentioned, but this change was not significant.

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[75] Levene's test for equality of error variances was satisfied[75], $F(5,752) = 2.79$, $p = .017$.
[76] Partial eta squared is the measure of effect size and tells you the proportion of the total variance that accounted for by each predictor.

Table 6-1 *Test of between subjects effect: dependent variable perceived attractiveness of job*

Source	df	SS	MS	*F*	*p*	*Partial eta squared*
Intercept	1	3831.43	3831.43	4791.650	.000	.864
Pension condition	2	2.156	1.078	1.348	.260	.004
Regulatory condition	1	.462	.462	1.348	.447	.001
Pen.con*Reg con	2	10.43	5.213	6.519	.002	.017
Error	752	601.30	.800			
Total	758	4444.89				
Corrected Total	757	614.26				

R^2 = .021

Table 6-2 *Estimated marginal means of perceived attractiveness of job as a function of regulatory condition*

	perceived attractiveness of job		
Regulatory condition	n	*M*	*Standard Error*
Promotion	376	2.27	.05
Prevention	382	2.22	.05

Note: attractiveness is scored from 0 – 5

Table 6-3 *Estimated marginal means of perceived attractiveness of job as a function of pension condition*

	Perceived attractiveness of job		
Pension condition	n	*M*	*Standard Error*
No pension	253	2.301	.056
4% pension	254	2.269	.056
10% pension	251	2.175	.056

Note: attractiveness is scored from 0 – 5

While the main effects were not significant, there was a significant interaction between pension condition and regulatory condition, $F(2,752) = 6.52$, $p = 0.002$ $\eta^2_{partial} = .017$. However, in the absence of a good theoretical (or common sense) explanation for this interaction it seems a stretch to read anything meaningful into this result.

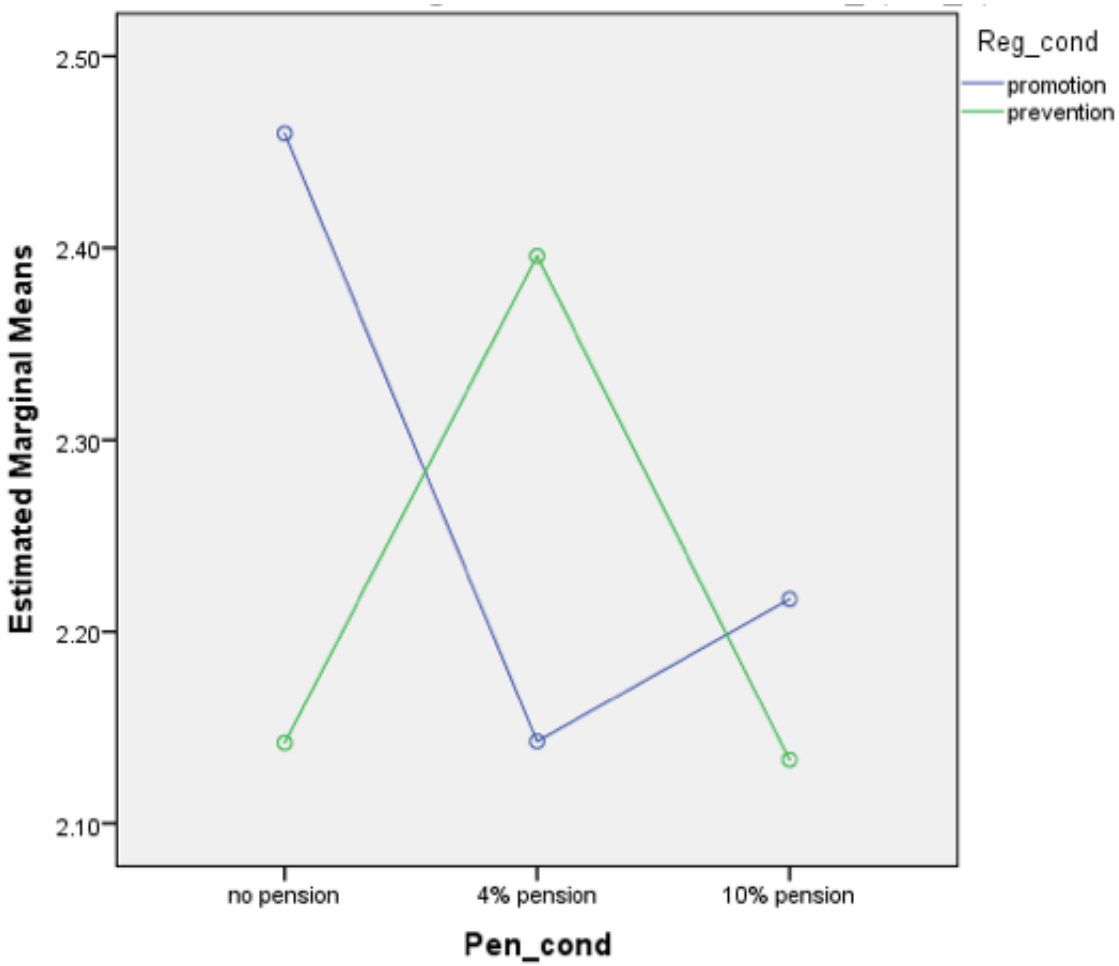

Figure 6-2 Estimated marginal means of perceived attractiveness of job as a function of pension condition and regulatory condition

Note: Higher scores indicate the job is perceived as less attractive

6.6.2 Controlling for Demographic Variables

The lack of statistical significance for the main effects of the two manipulations (pension condition and regulatory condition) on interest in the job remained after controlling for other demographic variables. A multiple linear regression analysis (enter method) estimated using SPSS Generalised Linear model was used to see if the two main manipulations (pension condition and regulatory condition) controlling for age, income and gender, predicted interest in the job. The overall regression model was marginally significant, $F(6,750) = 2.03$, $p = .060$. $R^2 = .016$. However, only age, controlling for the

other variables, had a statistically significant (but small) negative impact[77] on interest in the job ($p = .019$, $\beta = .007$[78]). Each increase in age of one year was associated with a decrease in interest in the job of 0.007 points.

Table 6-4 *Linear regression of perceived attractiveness of job*

	Unstandardized coefficients			
	b	*SEb*	*t*	*p*
Constant	2.140	.129	16.560	.000
	(1.89, 2.39)			
4% pension	-.033	.080	-.415	.678
	(-.19, .12)			
10% pension	-.135	.080	-1.688	.092
	(-.29, .2)			
Regulatory	-.033	.065	-.507	.612
condition	(-.16, .10)			
Age	.007	.003	2.345	.019
	(.01, .01)			
Earnings	-.008	.023	-.338	.736
	(-.05, .04)			
Gender	-.09	.067	-1.432	.153
	(-.23, .04)			

Note: $R^2 = 0.016$
Note: 95% confidence intervals reported in parentheses
Note: Perceived attractiveness of the job is scored 1 – 5 where higher scores indicate less interest in the job.
Note: No pension is the base case for the dummy variables: 4% pension and 10% pension
Note: Regulatory condition; 1 = prevention 0 = promotion
Note: Dummy Gender: 1 = male, 0 = female

[77] By this I mean that the while the coefficient for age was positive, as higher scores represent less interest in the job, a positive coefficient implies that as people get older, controlling for the other variables, they become less interested in the job.
[78] Note the while β coefficient was positive, increases in the score for mean interest indicate that a job is *less* desirable.

6.6.3 Perceptions of Culture

The second dependent variable being considered in the study was perceptions of company culture, specifically '*perceptions of stability*'[79] and '*perceptions of innovation*'[80]. In short, the two manipulations (the different levels of pension offered, as well as how they were framed) had no significant impact on respondents' perceptions of the values of the company. The dependent variable of '*perceptions of stability*' (made up of three items, Cronbach's alpha .64[81]) was used in a two by three analysis of covariance (ANCOVA) using SPSS General Linear Model with pension condition and regulatory condition as factors, controlling for age[82]. The main effects of the pension condition and regulatory condition, as well as the interaction effect, were not statistically significant: main effect of pension condition: $F(2,750) = 0.95$ $p = .386$ $\eta^2_{partial}$ 0.003. Main effect of regulatory conditions: $F(1,750) = 0.08$ $p = .782$ $\eta^2_{partial} < 0.001$. Interaction pension condition*regulatory condition $F(2,750) = 0.30$ $p = 0.745$ $\eta^2_{partial} = 0.001$ (see appendix B.4 for full details).

The same procedure was carried out with the dependent variable of innovation (made up of three items, Cronbach's alpha .55[83]). Levene's test of equality of error variances was satisfied, $F(5,751) = .89$, $p = .487$. Again, there were no significant main effects or interaction effects. The main effect of pension condition on *perceptions of innovation* was $F(2,750) = 1.83$ $p = .162$ $\eta^2_{partial}$ 0.005. Main effect of regulatory conditions: $F(1,750) = 0.14$ $p = .711$ $\eta^2_{partial} < 0.001$. Interaction pension condition*regulatory condition $F(2,750) = 0.22$ $p = 0.804$ $\eta^2_{partial} = 0.001$ (see appendix B.5 for full details).

In sum it was found that the level and framing of the pension offer in the job advertisement had no significant impact on perceptions of company culture. There was no support found for the suggestion that the level or framing of a company's pension plan impacted perceptions of company culture.

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[79] Called culture score stability – this was the average of the three answers on Q46 1,2,3.
[80] Called culture score innovation – this was the average of the two answers on Q46 4,5,6.
[81] Note Cronbach's alpha was 0.56 when only stability and predictability were included
[82] Levene's tests for the assumption of homogeneity of variance. This tests the null hypothesis that the error variance of the dependent variable is equal across groups. Note that here the Levene's test was not satisfied $F(5,752) = 2.46$, $p = .032$.
[83] Note Cronbach's alpha was 0.43 when only being innovative and risk taking were included

6.6.4 Pensions as a Sorting Device

The results described above consider the extent to which the level of pension offered, as well as how it was framed, impact demand characteristics. In this section we go on to consider question (ii): whether varying the salience of different career incentives at the recruitment stage attracts a different type of worker. In other words, does the perception of the different reward packages depend on a) observable characteristics such as educational level, or 'Grit scores' as well as b) a less easily observable measure such as subsequent performance on the persistence task?

Educational level and "Grit" scores: Multiple regression was used to test, among the group that saw the job advert with the 10% pension, if Grit scores and educational level significantly predicted perceived attractiveness of the job. Using SPSS Generalized Linear Model the following model was tested:

Mean interest = β0 + β1 (Grit_score_sum) + β2 (Education_Q11) + β2 interaction

While the results of the overall regression model were significant, $R^2 = 0.042$, $F(3,247) = 3.63$, $p = .014$, the individual predictors, and the interaction term were not themselves significant: Grit: $\beta = -.038$, $p = .266$, Education: $\beta = -.093$, $p = .775$, Interaction term: $\beta = 0.008$, $p = .371$ (see appendix B.6 for details).

Persistence task[84]: Looking only at the group that saw the job advert with the 10% pension, running a one way analysis of variance there was again no statistically significant impact of whether or not people had passed the persistence task on mean interest in the job, $F(1,249) = 0.15$, $p = .702$.

[84] Note of coding for persistence task: 'Bonus 3': 1= emailed me 0 = either did not email me, or emailed Heather, or Dan.

Table 6-5 *Means and standard deviations of perceived attractiveness of job as a function of completion of persistence task*

	Perceived attractiveness of job		
Persistence task	n	*M*	*SD*
Not completed	184	2.19	.90
Completed	67	2.14	.90

Note: mean interest in the job is scored from 1 to 5 where higher scores represent less interest in the job.
Note: For those who were in the 10% pension condition only

Table 6-6 *One-way analysis of variance of perceived attractiveness of job by completion of persistence task*

Source	*df*	*SS*	*MS*	*F*	*p*
Between groups	1	.12	.12	.15	.702
Within groups	249	200.84	.81		
Total	250	200.95			

Note: For those who were in the 10% pension condition only

6.7 Discussion

There were three research questions:

(i) Does providing a larger amount of a (roughly equivalent) total compensation package as a pension, affect perceptions of the attractiveness of a job, and perceptions of company culture?

(ii) Does varying the salience of a pension at the recruitment stage attract a different type of worker?

(iii) Does framing a company's pension plan in terms of promotion versus prevention affect perceptions of attractiveness of a job and perceptions of company culture?

With regard to the first and third questions: when responding to a job advert there was no impact of either of the two manipulations (the level or the framing of the pension) on perceived attractiveness of the job. While respondents were *slightly* more interested in the job as a higher pension was mentioned, this effect was not statistically significant. With regards to perceptions of company culture, specifically '*perceptions of stability'* and '*perceptions of innovation*', again neither of the two main manipulations had any statistically significant impact on perceptions of company culture.

The second question addressed whether different incentives may attract a different type of worker. This also had null results. Testing the idea that a more generous pension

might be more appealing to those with higher educational levels or higher self-reported scores of 'Grit' yielded null findings. There was no statistically significant association between education or Grit scores and the perceived attractiveness of the job. Finally, the persistence task was used as a behavioural measure for Grit. Rather than just asking people about how persistent they are, they were presented with a task that required them to demonstrate a small degree of effort in exchange for a small reward[85]. Again, there was no statistically significant impact of whether or not people had passed the persistence task on how attractive they found the job.

6.8 Conclusion

Chapter 5 found that the majority of employers believed pensions were almost irrelevant to their employees. The results of the experiment in this chapter would support this belief. There was no statistically significant impact of the level or the framing of a pension on perceived attractiveness of a job. In other words, the mention of a higher pension, or the manner in which this was framed, had no impact on how participants rated the job. There was also no support for the idea of a pension as a sorting device.

There are at least three potential explanations for this pattern of, essentially null, results. First the manipulation was too weak. Respondents were shown only one advertisement, which was relatively sparse in information, and from that they were asked to state how interested they would be in applying for the job, as well as their perception of the values of the company. If the manipulation was too weak, it might just result in most people picking the middle value in the scale. Alternatively, our respondents might be the hyper rational creatures of economic research. The job adverts with the lower pension came with higher pay. The total value of the financial package was kept roughly constant. In comparison with defined benefit pensions, the benefits of a defined contribution pension are more easily reproduced. While capital markets are far from complete it is relatively easy for an informed saver to choose to save more privately, so arguably from an economic perspective it was rational for individuals to value the jobs equally on average. A third interpretation might be not that are respondents were rational, but rather they did not care about pensions at the point when they decide about a job. The level of the pension on

[85] Note there was no statistically significant association between those who performed the persistence task and their self-reported scores on Grit.

offer, as well as its framing was essentially irrelevant to their decision. This is not an unimportant question. If employees systematically underestimate the value of a pension when making employment choices, employers will no longer choose to provide good pensions and 'bad' occupational pensions will tend to crowd out the 'good'. From a policy perspective there are then two options: you can force people to save for their pension, or you can educate them. Consequently the next two chapters report the results of a further two experiments that consider the impact that financial information can have on attitudes to pensions.

7 Experiment 2: Head versus Heart?

7.1 Introduction

If the experimental study in the preceding chapter found that the level of pension had no impact on how attractive people found a potential job, the following two chapters consider the impact that financial education can have on these preferences. This chapter looks at the impact that short educational messages can have on (i) attitudes to pensions, and (ii) the subjective value people place on reward packages where there is a trade-off between better pay now or a better pension later. It tests this on a sample pool of participants aged 22 – 32. The longer one delays saving, the harder it is to catch up[86], so it is important to understand if it is possible to prod younger people into good saving habits early.

The market for pensions is an archetypal example of a market in which the economic ideal of rational decision-making has a particularly poor fit. As Barr (2004) outlines, markets work best where: the better is consumer information, the more cheaply and effectively it can be improved, the easier it is for consumers to understand available information, the lower (and more reversible) are the costs of choosing badly and finally the more diverse are consumer tastes. On every one of these criteria the pension market is, to put it mildly, problematic. As a consequence, behavioural economics has been a particularly influential perspective in pension policy. The issue of whether it is possible to educate (rather than just 'nudge') individuals to improve their choices is more controversial. Most writers from a behavioural economic perspective are highly sceptical that financial education can do anything in the face of pervasive inertia (Choi et al., 2002). Fernandes et al's (2014) recent literature review on financial education was highly pessimistic about its effectiveness. Other authors are more positive (Lusardi, Keller, & Keller, 2009; Lusardi, Mitchell, & Curto, 2014), however their voices are in a minority. The experiments in this chapter and the next address this debate – asking if financial communication can help to improve decision-making when it comes to our pensions. Participants were randomised to see one of three educational nudges. A message designed to trigger fear, a message designed to trigger positive affect, and an emotionally neutral message.

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[86] As the 'Fear' message used in the experiment makes clear, if you start saving at the age of 25, a savings rate of 14% is needed to hit a reasonable target. If you leave it until the age of 45 you will need to save close to 50% of you earnings (appendix C.1).

This chapter proceeds as follows: first it outlines the theoretical framework, in particular the role of affect in decision-making. Second the model and the hypotheses are outlined. Next the study is described in more detail, before turning to discuss the results. The chapter then concludes with a discussion. The following chapter goes on to repeat the experiment with an older age group, and consequently chapter 8 contains a general discussion of both studies, as well as a discussion of the limitations of the experimental method.

7.2 Theoretical Framework: Head versus Heart

The experiments outlined in this and the next chapter draw on the Risk-as-Feelings hypothesis of Loewenstein et al. (2001). As they argue, much research on financial decision-making has concentrated entirely on our cognitive biases and neglected the role of affect at the moment of the decision. While emotions are often viewed as a negative corrupting influence they can also have a more positive effect – namely to provide the motivation necessary to pursue the chosen course of action. As Loewenstein & Lerner put it: "there is often a big difference between knowing what's best and doing what's best" (2009 p.635). Just as reading a diet book won't make you thin, knowing about the tax advantages to pension saving won't necessarily induce you to save more for your retirement. Loewenstein et al. (2001) note that almost all theories of decision-making under uncertainty are essentially cognitive. From this perspective, the assumption is that people assess the desirability and likelihood of possible alternative outcomes, and using some expectation-based calculus, arrive at a decision. They argue that the role of affect experienced at the *moment* of the decision has been neglected.

Fear

The field of preventative health communication is one in which the role of the emotions – in particular fear – has been well explored (Diefenbach et al., 2008). And there are parallels between thinking about your health and thinking about your retirement saving. Both require consistent small sacrifices that may, or may not, pay off. There is no guarantee that years of flossing, or eating your five a day, will result in perfect health, just as there is always a risk when investing money over the long term. In addition, both fields struggle with the fact that increases in knowledge or awareness often fail to translate into actual behaviour change. For example, Neuhauser and Kreps (2003) describe the results of

the ('state of the art') California '5 a day for better health' campaign that resulted in a substantial increase in knowledge, but limited behaviour change.

Much of this literature focused on the role that fear can play in driving behaviour. As outlined by Diefenbach et al. (2008, p.646) early work was based on the fear-drive reduction model of Dollard & Miller (1950). The central hypothesis underlying this model was that fear acts as a motivating force prompting individuals to perform recommended behaviours, which in turn reduce the unpleasant fear state. Inconclusive results (high fear often did not generate the hypothesized change) resulted in Janis and Feshbach's (Diefenbach et al., 2008) idea of defensive avoidance. Here instrumentality is key: there is some point at which we feel that we have no meaningful ability to influence events, and so we cease to behave in a goal centred way. Developing this idea of defensive avoidance Witte et al.'s (1998) extended parallel process (EPP) model argues that which path people go down (i.e. whether they actively change behaviour to avoid the feared outcome, or merely put their head in the sand) is a function of (i) response efficacy (beliefs about the effectiveness of the recommended response) and (ii) self-efficacy (beliefs about one's ability to perform the recommended response). These two factors, response efficacy and self-efficacy, correspond almost exactly to the mechanisms described by Vroom (1964) in Expectancy Theory as 'expectancy' (the belief that individuals have in their ability to perform a particular behaviour) and 'instrumentality' (the extent to which people believe if they do perform the desired behaviour, that the promised outcome will be achieved). Vroom argues that these, combined with 'valence' (the preference that an individual has for the outcome) determine motivational force to pursue an outcome.

Positive Affect

While the role of negative affect has been well explored, that of positive affect has received less attention. Fredrickson & Cohen (2000) suggest that the reason for this is that we are environmentally adapted to be particularly attuned to negative emotions for our survival: "Negative emotions appear strongly in the moment because they were sculpted by evolution to mobilize immediate action" (p.781). In contrast "positive emotions exert their power over the long term, and are critical to building a healthy and fruitful life" (p.781). They suggest that research has generally found that positive emotions are less distinct than negative emotions. Fredrickson & Cohn return to this asymmetry repeatedly: "Negative emotions help us respond to a single, immediate threat in contrast positive emotions more generally help us take advantage of life's numerous opportunities" (p.781). Prospect

theory (Kahneman & Tversky, 1979) has highlighted clearly the non-linearity in our responses to losses versus gains.

Consequently, and as supported by empirical evidence from many areas of psychology (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), negative emotions command more attention than positive ones and positive emotions are less distinct than negative emotions. In sum, the literature tends to support the idea that, while single negative emotions (for example fear or disgust) can be meaningfully studied in isolation, positive emotions are better studied as a group without isolating any one specific emotion such as love, hope or joy.

Consequently, the experiment in this chapter examines the impact that three different financial education nudges can have on attitudes towards pensions, as well as the subjective value people place on reward packages where there is a trade-off between better pay now or a better pension later. To test the role of affect on decision-making, two messages were designed to trigger fear and positive affect. A third message was designed to present pension information in an emotionally neutral manner. Put prosaically the research question examines whether we are driven by our heart, or our head, when making financial choices?

7.3 Model

The research question examines whether messages designed to appeal to our heart versus messages that appeal to our head will be more effective at increasing pension engagement. It hypothesises that the impact of these messages (on pension engagement) is mediated by their impact on expectancy, instrumentality and valence. This is based on Vroom's (1964) model of expectancy theory, which hypothesises that the motivation to carry out an action is a function of expectancy (the belief that individuals have in their ability to perform a particular behaviour) instrumentality (the extent to which people believe if they do perform the desired behaviour, that the promised outcome will be achieved) and valence (the preference that an individual has for the outcome).

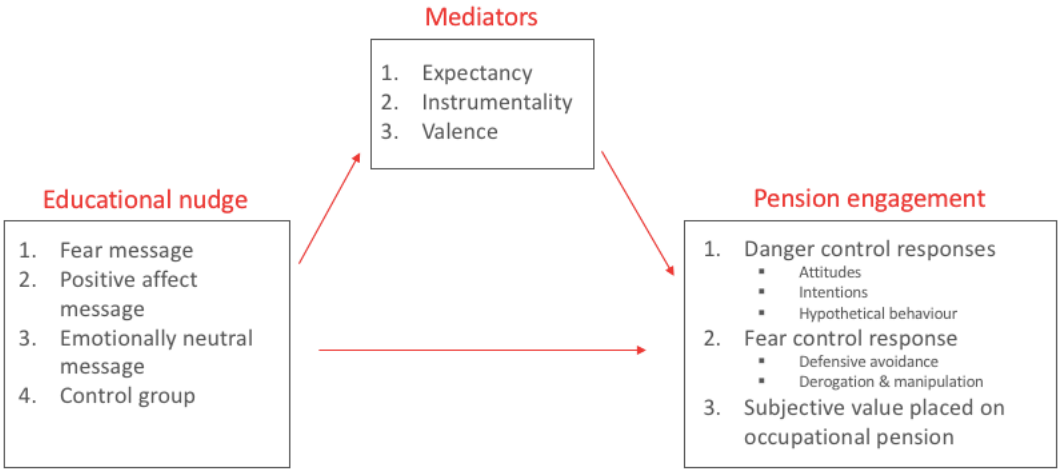

Figure 7-1 Head versus Heart: a model of pension engagement

7.4 Hypotheses

Hypothesis 1: That participants who are exposed to the fear message will have greater perceptions of fear towards under saving.

Hypothesis 2. That participants who are exposed to the positive affect message will have higher levels of positive affect.

Hypothesis 3. That participants who are exposed to the emotionally neutral message will have higher scores on pension knowledge.

Hypothesis 4. That the educational nudges will be associated with increases in pension engagement (as measured by danger control responses, fear control responses, and subjective value placed on an occupational pension) compared to the control group.

Hypothesis 5. That the impact of the three messages on pension engagement will be mediated by expectancy, instrumentality and valence.

7.5 Study Description

Participants were randomly allocated to read one of three short educational nudges that contained information relating to pensions and saving. One message was designed to generate fear, one was designed to trigger positive affect, and one was emotionally neutral containing only information. The fourth group was the control group and received no

message. All participants were then asked a series of questions to measure pension engagement (outlined more fully below).

7.6 Methods

7.6.1 Participants and Design

N = 418 participants were recruited through online data pool Prolific. They were paid £2 to complete the study and were pre-screened to be aged 22 – 32, not a student, in full or part time work, and resident in the UK. There was an attention filter and those participants who failed were excluded from the analysis. An alpha level of 0.05 was used for all statistical tests.

7.6.2 The Messages

Participants were randomly allocated to see one of three financial education nudges, or to be in a control group. The messages took about 2 minutes to read. The full text of the messages and the survey are in appendix C.1 and C.2 respectively.

Fear message: The fear message was based on a BBC news article that made clear the very high saving required to achieve an adequate income in retirement. For example, it highlighted the fact that, for those on average earnings, if you leave it until you are aged 40 to start saving, then you will need to save half your income to have saved enough for an income of £12,000 a year in retirement. The information for this message was taken from: http://www.bbc.co.uk/news/business-38609422. The text was slightly reduced, and a definition of a defined benefit pension was added. All the information in the message was accurate. The message was chosen after testing (see details of the pilot studies below). It was decided to use a message from the mainstream media, as newspapers rely strongly on shock messages to generate reader attention.

Positive Affect message: This message was a blog post "Getting Rich: from Zero to Hero in One Blog Post" taken from an extremely popular US financial blogger (https://www.mrmoneymustache.com/). This blog is part of the US early retirement/ financial independence movement. It preaches a strongly anti-consumerist message, which argues that most middle-class people can and should spend less money, consistently investing the rest, to live with increased financial freedom and happiness. It argues that, far from being a sacrifice, spending less and saving more is a life-boosting experience, describing the typical middle-class life style as "an exploding volcano of wastefulness".

Again, this message was chosen, as the blog in question has built up a very large and loyal following, based on the strength of its positive message[87]. Rather than attempting to write a bespoke message for this experiment, the popularity of this blog seemed to demonstrate good face validity.

Emotionally neutral message: This message was taken from information from the Money Advice Service (https://www.moneyadviceservice.org.uk/en), an impartial website set up by the UK government to provide money advice. The message was designed to avoid any emotional references, and also contained the most information about pensions. For example, while describing the basic state pension it removed any references that suggested it might not be enough to live on. It outlined the three main types of pension and outlined the advantages to pension saving (tax relief, the top up from your employer, the historically stronger performance of equities).

7.6.3 Pilot Studies

Two pilot studies were initially carried out. The first pilot study (n=39) was carried out to test the survey instrument. A second larger pilot study (n = 90) was carried out to test two (alternative) fear messages (see appendix C.3), against the emotionally neutral message, to confirm that the messages did indeed trigger emotions of fear. As discussed more fully below, the impact of fear was measured in three ways: with a fear index, a threat index and a negative mood index. Both the fear messages were associated with a statistically significant positive impact on the negative mood index, $F(2,87) = 3.94$ $p = .023$. However, neither fear messages had a statistically significant impact on the levels of fear as measured by the threat index or the fear index. Given that both fear messages generated similar results on the negative mood index, it was decided to use the first fear message.

7.6.4 Measures

Seven point Likert-type response formats were used except where noted.

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[87] His blog has had over 2.7 million page views (https://www.seethestats.com/site/mrmoneymustache.com

Tests of Educational Nudges

To confirm that the educational nudges worked as hypothesised, they were tested in the following way:

Fear: Following Witte (1998) fear was measured in two alternative ways. First, with a threat and a fear index, second with a negative mood index. The threat index was measured with three items for susceptibility (for example "it is likely that I will not save enough for retirement"), three for severity (for example: "I believe that under saving for retirement is a serious problem") which were combined into the threat index. The threat index was scored from 6 to 42 (where the higher the score the more you agree that you are at risk of under saving and that under saving is a serious problem). Fear itself was measured with three items (for example "I am frightened that I might not have enough to live on when I am older") which were combined into the fear index. The fear index was scored from 3 – 21 (where the higher the score the more you agree that you are frightened of not having enough money in retirement)[88].

The second way of measuring fear was through the negative mood index. This asked participants to indicate their current mood using three adjectives[89]; frightened, scared, anxious. This was scored from a minimum of 3 to a maximum of 21 where higher numbers indicate a more negative mood.

Positive affect: The positive affect message was measured using the PANAS scale (Watson et al. 1998) which is a 10-item scale scored on a scale of 1 – 5 where 1 = very slightly or not at all, and 5 = extremely. This asked participants the extent to which they felt: excited/ strong/ enthusiastic/ proud/ alert/ inspired/ determined/ attentive/ active/ interested at that present moment.

Pension knowledge: This was assessed by asking four questions designed to measure the essential knowledge one would require to make the most basic decisions around an occupational pension in the UK. It asked whether a defined benefit or a defined contribution pension (from the employee's perspective) was better. It asked participants if

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[88] The logic being that fear requires two steps: (i) you have to be frightened of something, and (ii) you also have to feel that it is a threat to you. For example, I am not very frightened of being eaten by a polar bear, I accept that that is a frightening thing, but as it does not threaten me in London, I am not frightened by it and would not take any steps to avoid it.

[89] To clarify, Witte et al., in their pilot test, measured the fear messages by using the threat and fear index. In the main study they used the ratings of mood adjectives.

they knew the tax relief they got on pension contributions; if they knew the amount of the tax-free lump sum you get when you take your pension; and finally, if they knew the current value of the maximum Basic State Pension.

The Dependent Variables

There were three groups of dependent variables. As a shorthand, they are referred to collectively throughout this document as 'pension engagement'. The first two dependent variables, (I) 'danger control responses' and (II) 'fear control responses', were informed by Janis and Feshbach's idea of defensive avoidance and Witte et al.'s (1998) extended parallel process (EPP) model. Both note that messages that are frightening can do one of two things: they will either drive changes in behaviour that prevent the feared outcome ('danger control responses'). Less constructively, they can merely result in avoidance ('fear control responses'). In other words, being alerted to a danger can either provoke attempts to control the danger, or merely avoidance – i.e. control of the fear. Finally, in line with the argument made throughout this thesis that job choice has a crucial impact on retirement income, the third outcome tested (III) was the subjective value placed on a job package where there is a trade-off between pay and pension.

(I) Danger Control Responses

This was made up of questions that measure *attitudes*, *intentions* and *hypothetical behaviour* towards pensions.

Attitudes: This was measured by using three questions that asked about attitudes to pension saving ('Saving in a pension is a good way to save for retirement/ My workplace pension is a good way to save for retirement/ An occupational pension is a good way to save for retirement') where a higher score represents more agreement with the statement. An index was created (*attitudes to pension index*) that was the sum of the three questions.

Intentions: This was measured by asking participants how likely they were to increase their saving in their pension. Those who were not already saving in a pension were asked how likely they were to start saving in a pension next year.

Hypothetical behaviour: Here participants were told to imagine that they had just started a job with a salary of £35,000 and were going to be auto enrolled into the company's pension scheme with a total contribution of 8%. Participants were then asked, if in this situation, would they choose to make additional contributions (yes/no/I don't know).

(II) Fear Control Responses

Following Witte et al. (1998), this is made up of questions that capture the extent to which a message, rather than driving changes in behaviour, will provoke a 'head in the sand approach' of ignoring or rejecting the message.

Defensive avoidance: Participants were asked two questions. First, if when they hear about pensions their first instinct is: to think about it/ not to think about it. Second if, when they hear about pensions, it makes them: want to do something/ not want to do something.

Derogation and manipulation index: Finally, participants were also asked to say the extent to which they agreed with six statements such as: "The message I just read was overblown/ exaggerated/ overstated/ manipulative/ misleading/ distorted" where higher figures indicate stronger agreement. The sum of their responses was combined into a 'derogation and manipulation index' where higher scores represent a greater rejection of the message.

(III) Subjective Value Placed on an Occupational Pension

The final set of dependent variables related to the subjective value respondents placed on different reward packages where there was a trade-off between better pay or a better pension. Three hypothetical scenarios (described below) were presented to participants. The total value of the reward packages presented to participants was selected with reference to pay data from the Office of National Statistics ("ASHE table 6," 2016). As the primary variable of interest was the subjective value placed on the *trade-off* between pay and a pension, the pay levels used in the study were at the upper end of this range. In other words, most respondents would be able to look at the packages and not have to imagine a pay cut, rather their preference ratings would reflect the trade-off between pay and pension[90] (See appendix C.4 for details of salary calculations).

(i) Comparing DB to DC pensions: The first scenario asked participants to compare and rate two reward packages, one with a DB and one with a DC pension. The total cost to

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[90] Office of National Statistics ("ASHE table 6," 2016). In 2016 median full time annual earnings for those aged 22- 29 were £23,686 (male) and £21,653 (female). For men this ranged from £14,942 at the 10th percentile to £39,204 at the 90th percentile. For women the equivalent range was £13,505 to £35,019

the employer of both packages was broadly the same. This is based on the assumption that a generous defined benefit pension would cost the employer 40% of salary.[91] Participants were asked to imagine that they had been offered two different jobs, which they liked equally, where the only difference was in the pay and pension. One had a DB pension, and one had a DC pension. They were then asked to say how attractive they found these two reward packages compared to each other (on a scale of 1-100).

Job A: A salary of £26,000 and a generous DB pension

Job B: A salary of £35,400 and a DC pension of 3%

(ii) Comparing different DC pensions: The second scenario asked participants to compare and rate a series of three reward packages, all with DC pensions of increasing generosity. As before, the total cost to the employer was kept broadly the same.[92]

Job A: A salary of £35,400 plus employer pension contributions of 3% of salary

Job B: A salary of £33,200 plus employer pension contributions of 10% of salary

Job C: A salary of £30,400 plus employer pension contributions of 20% of salary

(iii) Comparing job choice where there was an incentive to defer: The third scenario asked participants to choose one option out of seven alternative reward packages. In this case there was an incentive to defer, in that the more individuals chose to defer their pay, the higher was the total value of the reward package. Consequently, the total cost to the employer was not kept constant. The options ran from a basic salary of £31,500 plus an employer pension contribution of 30% (total value = £40,950) to a basic salary of £36,000 with no employer pension contributions (total value = £36,000).

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[91] It is not straightforward to calculate the cost to the employer of a pension, in particular the cost of a defined benefit pension. In this paper an estimate of 40% has been used. This is based on a recent estimate made by LCP accounting for pensions (*LCP Accounting for Pensions 2016*, 2016) which calculated that, based on IAS19 accounting standards, the cost to the employer of providing a final salary defined benefit pension with a 1/60th accrual was now at 50% of salary. This estimate, however, is highly sensitive to the assumptions used (in particular the unprecedented low return on bonds), and consequently it has been revised down to 40% for caution (and not to flatter the researcher's hypothesis that individuals underestimate the value of a pension).

[92] It is a less tricky matter to establish the cost of a defined contribution pension. In this paper the cost is very slightly overstated as it does not take account of the fact that employers don't have to pay National Insurance on pension contributions and that this saving of up to 13.8% can be retained by the company. For example, by contributing £1,000 directly into an employee's pension instead of paying the equivalent in salary, the company can save up to £138 in National Insurance (Hargreaves and Lansdowne http://www.hl.co.uk/pensions/sipp/how-much-can-i-invest/employer-contributions).

Mediators

Expectancy: Expectancy is the belief that individuals have in their ability to perform a particular behaviour, in this case to save money in a pension. Respondents were asked three questions that related to how hard they find it to save, for example: "How easy is it for you to save towards your pension" where 1 is extremely difficult and 7 is extremely easy. A scale was created (EXPSCALE) which combined (added) these three items.

Instrumentality: Instrumentality measures the extent to which people believe if they perform the desired behaviour that the promised outcome will be achieved. It is related to issues such as trust in the system and understanding of the correlation between performance and outcomes. Instrumentality was measured with 5 items that were combined into a scale (INSTSCLE). For example, participants were asked their agreement with statements such as "The tax relief given on pension saving make it good value for money" or "I trust my occupational pension fund to invest my money well". Each item was scored 1 – 7, where higher scores represent more belief/trust that saving in a pension will result in the desired outcome.

Valence: Valence is the extent to which a person values a given outcome and reward. The aim of this study was to measure the impact of various educational nudges on pension engagement, controlling for expectancy, instrumentality and valence. In other words, the valued outcome is having enough money in retirement, the method to achieve it is saving in a pension. Valence was measured following Binswanger & Carmen (2009) by asking to what extent people want to smooth their income over their lifetime. Option A was scored 1 and option F was scored 6, so higher scores reflect a desire for an income profile that increases with retirement. A score of 4 = option D which represents a desire for a flat income profile over your lifetime.

	Monthly spending during working life (age 25 until retirement)	Monthly spending during Retirement
Option A	£2,950	£1,900
Option B	£2,900	£2,200
Option C	£2,800	£2,500
Option D	£2,750	£2,750
Option E	£2,650	£3,200
Option F	£2,600	£3,600

Potential Control Variables

Age, gender, time in the work force, earnings, perceived social status and perceived income stability were assessed for use as potential control variables. Perceived social status was measured using the MacArthur Scale of Subjective Social Status (Adler & Stewart, 2007). Following Bajtelsmit and Bernasek (2001) participants were also asked how stable they felt that their income would be in their future career (measured on a 5 point scale where 1 = very unstable and 5 = very stable).

7.7 Results

The research question examines whether we are driven by our heart or our head when making financial choices? It tested the impact of three different messages (designed to trigger fear, trigger positive affect, or to convey information neutrally). It was hypothesised that the impact of these messages on pension engagement would be mediated by their impact on expectancy, instrumentality and valence.

The results are discussed as follows: The first step was to establish whether the educational nudges had the hypothesized effect on fear, positive affect and knowledge. Next, the main effect of the experimental condition on the dependent variables is described: did the educational nudges have any (positive) impact on pension engagement? Next it examines the mediation hypothesis. This asks why the messages work: that is, is the impact of the educational messages on pension engagement explained by the impact they have on expectancy, instrumentality and valence. Finally, fear is considered as a moderator. A null hypothesis is not normally sought out by the researcher, however in this case a null result has important implications. The UK pension system is one based on free

choice, and thus places considerable responsibility on individuals to make the right decisions. Consequently, there are repeated calls from the government, the press, and trade bodies to educate and 'engage' people with their pensions. Is this a worthwhile aim, or an exercise in futility?

7.7.1 Descriptive Statistics

The average age of participants was 27 years. 109 (26%) were male, 306 (73%) were female (three participants preferred not to say). The large majority of participants (82%) earned less than £29,999 per annum, with 14% earning less than £10,000. Pension knowledge was poor and participant's general awareness of their own pension situation was low. Just over 60% of participants said they were saving in a pension, and 30% said they did not know which type of pension (DB or DC) they had. Over 50% of participants did not know how much money their employer put into their pension, and 45% of participants did not know how much they were putting into their pension.

7.7.2 Effect of Educational Nudge on Fear, Positive Affect and Knowledge

Fear

As outlined above, fear was measured in two alternative ways. First it was measured with a threat index (made up of three questions relating to susceptibility and three to severity) and a fear index. The threat index captured the extent to which participants believed they were at risk of under saving, and the fear index captured the extent to which this frightened them. Cronbach's alphas for the susceptibility and severity index were .93 and .70 respectively. Cronbach's alpha for the fear index was .82. The second way fear was measured was through a negative mood index. The negative mood index had a Cronbach's alpha of .931 demonstrating high internal reliability.

While in general participants were quite frightened by the idea of saving for retirement, there was no statistically significant impact of the educational nudge on the threat and fear index. Running a one way analysis of variance (ANOVA) estimated using SPSS Generalized Linear Model, the results were: $F(3,414) = 0.84$, $p = .474$ for the threat

index and $F(3,414) = .79$, $p = .503$ for the fear index (see table 7.1) where the means and standard errors[93] (in brackets) are reported.

The second way in which fear was measured was by asking participants to rate three mood adjectives[94]. Here the results of an ANOVA hovered at the edge of significance, $F(3,414) = 2.35$ $p = .072$, and the results went in the direction predicted by the model. The condition that generated the most negative mood was the fear condition (mean score of 13.41, *se* = .48) compared to the control group which exhibited the least negative mood (mean score 11.78, *se* = .47) (see table 7.1).

In sum, the results here were somewhat inconsistent. When measured using the threat and fear indexes, there was no association between the educational nudge which participants read and subsequent self-reported levels of anxiety about their retirement savings: across all conditions levels of anxiety about retirement saving seemed relatively high with most respondents agreeing that they are at risk of under saving, that this is a problem, and that this worries them. However, the educational nudge did have a marginally statistically significant impact on fear as measured by the negative mood index (at the 10% level of significance).

Positive Affect

If the fear message had a weak or no impact on arousing higher fear than the other messages, the next question is whether the message designed to trigger positive affect did in fact elicit feelings of positive affect in the participants, and thus consequently would be more likely to result in positive attitudes, intentions and behaviour towards pensions.

Positive affect was measured using the PANAS scale (Watson et al. 1998). Cronbach's alpha = .911 again indicating high internal reliability. The condition the participants were in had a significant impact on the levels of positive affect they reported, $F(3,414) = 4.10$, $p = .007$ (see table 7.1). Those participants who read the positive affect

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[93] The standard error is a measure of the estimated distribution of the population mean. It is measured using the standard deviation (i.e. the measure of variability in the sample) divided by the square root of the sample size. It allows you to provide an estimate of the range of values in which the population mean is likely to fall, based on the central limit theorem. To obtain the upper and lower limits of a 95% confidence interval multiply the *se* by 1.96 and add and subtract this from the sample mean.

[94] To clarify, Witte et al., in their pilot test, measured the fear messages by using the threat and fear index. In the main study they just used the ratings of mood adjectives.

Table 7-1 *Means and standard errors of threat index, negative mood index, positive affect index and pension knowledge as a function of educational nudge*

condition	n	Threat index *M (se)*	Fear index *M (se)*	Negative mood index *M (se)*	Positive affect index *M (se)*	Pension knowledge *M (se)*
Fear	104	33.00 (.51)	17.37 (.31)	13.41 (.48)	27.37 (.80)	1.09 (.11)
Positive affect	107	31.93 (.55)	17.38 (.32)	12.36 (.44)	31.22 (.86)	1.02 (.11)
Emotionally neutral	99	32.94 (.62)	17.62 (.30)	12.10 (.56)	28.82 (.88)	1.99 (.11)
Control	108	32.36 (.55)	16.94 (.33)	11.78 (.47)	30.21 (.77)	1.26 (.10)
total		$F(3,414) = 0.84$, $p = .474$	$F(3,414) = .79$, $p = .503$	$F(3,414) = 2.35$ $p = .072$.	$F(3,414) = 4.10$, $p = .007$	$F(3,414) = 16.95$, $p < .000$.

Note: Threat index is scored from 6 - 42 where higher scores represent a higher perception of threat.
Note: Fear index is scored from 3 - 21 where higher scores represent more fear.
Note: Negative mood index is scored from 3 – 21 where higher scores represent a more negative mood.
Note: Positive affect index is scored from 10 – 50 where higher scores represent higher positive affect.
Note: Pension knowledge is scored from 0 to 5. Where higher scores represent better knowledge.

message had the highest level of positive affect (M = 31.22, se = .86) while those who read the fear message had the lowest levels of positive affect (M = 27.37, se = .80).

Pension Knowledge

Finally pension knowledge was assessed by asking four questions designed to measure the essential knowledge one would require to make the most basic decisions around an occupational pension. Overall, pension knowledge was very low. Only 39% of respondents correctly identified that a defined benefit pension was better than a defined contribution pension for the employee. Only 21% knew that the tax relief on pension contributions was 20% (for a basic rate tax payer), only 24% knew that you can take 25% of your pension savings tax free. However nearly half, 47%, were able to identify the correct amount of the basic state pension. In sum, only 5% of respondents got all the answers right, with the mean score at 1.3.

The communication nudge that participants were allocated to read had a statistically significant impact on pension knowledge: $F(3,414) = 16.95$, $p < .001$. Those participants who read the emotionally neutral message (which had the heaviest focus on information) scored most highly (M = 1.99, se = 0.11), although even this group on average only got two out of the four questions right.

In sum, with reference to the first three hypotheses the three messages tested (fear, positive affect and emotionally neutral) had respectively a weak or mixed effect on fear, a statistically significant impact on positive affect, and a statistically significant effect on pension knowledge:

- The fear message had no impact on fear as measured with the threat and fear indexes. However, when measured using the negative mood index, using a test of significance of .10, then there was a significant impact in the predicted direction. Those participants who read the fear message had the highest levels of negative mood, and those in the control group the lowest.
- The positive affect message had a statistically significant impact on the positive affect index. Those participants who read the positive affect message had the highest levels of positive affect, and those in the fear group the lowest.
- The emotionally neutral message had a statistically significant impact on knowledge. Those participants who read the emotionally neutral message had the highest levels of knowledge.

7.7.3 Main effect of Educational Nudge on Pension Engagement

The fourth hypothesis was that the education nudges that participants read would, compared to the control group, lead to higher pension engagement. Pension engagement was measured with three groups of dependent variables: (I) 'danger control responses' which are made up of attitudes, intentions and hypothetical behaviour towards pensions; (II) 'dear control responses' which capture extent to which a message, rather than driving changes in behaviour, will provoke a 'head in the sand approach' of ignoring or rejecting the message; and (III) the subjective value placed on different reward packages where there is a trade-off between pay and pension.

(I) Danger Control Responses

Attitudes: Attitudes to pensions were measured with three items that asked about attitudes to pension saving. An index was created[95] that was the sum of the three questions (Cronbach's alpha = .871). In general (perhaps surprisingly) most participants were very positive about pensions. The educational nudge that the participants read had a significant (if not particularly striking) impact on attitudes to pensions. A one-way analysis of variance, $F(3, 414) = 5.47$ $p = 0.001$[96] found that those in the emotionally neutral group were more positive about pensions than all the other groups (see table 7.2 for summary statistics).

Intentions: This was measured by asking participants to report either how likely they were to start, or increase, their pension saving. Running a one-way analysis of variance there was no statistically significant impact of the educational nudge on intentions to save. The results of a one-way analysis of variance were: $F(3,261) = 1.76$, $p = .155$, and: $F(3,149) = .94$, $p = .424$ respectively (see table 7.2).

Hypothetical behaviour: Finally, participants were asked to make a hypothetical choice about whether they would choose to make additional pension contributions. Overall just under half of the participants said that, if asked, they would choose to make additional pension contributions. However, this result did not differ according to the

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[95] ATTPENS

[96] Note the assumption of homogeneity of covariance was satisfied: $F(3,410) = .70$, $p = .533$.

Table 7-2 *Means and standard errors of attitudes, and intentions to pensions as a function of educational nudge*

		Attitudes		Intentions to increase saving		Intentions to start saving
condition	n	*M (se)*	n[a]	*M (se)*	n[b]	*M (se)*
Fear	104	16.50 (.39)	59	3.19 (.25)	38	4.44 (.30)
Positive affect	107	16.21 (.34)	77	3.74 (.22)	28	4.23 (.33)
Emotionally neutral	99	17.97 (.27)	57	3.04 (.26)	37	3.83 (.26)
Control	108	16.48 (.33)	72	3.31 (.22)	32	4.39 (.31)
total		$F(3, 414) = 5.47$ $p = 0.001$		$F(3,261) = 1.76,$ $p = .155.$		$F(3,149) = .939,$ $p = .424.$

Note: Attitudes to pensions scored from a minimum of 3 to a maximum of 21, where higher scores represent more positive attitudes to occupational pensions as a way to save for retirement.
Note: Intentions to increase saving measured on a scale of 1 – 7, where 1 = extremely unlikely and 7 = extremely likely.
Note: Intentions to start saving measured on a scale of 1 – 7, where 1 = extremely unlikely and 7 = extremely likely.
a: this is the numbers of participants who said they were already saving in a pension, and were thus asked about intentions to increase saving.
b. this is the number of participants who said they were not currently saving in a pension and were thus asked about intentions to start saving.

educational nudge they read: The results of a chi-squared test of independence were: $\chi 2$ (6, N = 418) = 3.76, p = .709.

To summarise, with reference to the fourth hypothesis, the effect of the message that participants read on danger control responses (attitudes, intentions and hypothetical behaviour) was at best mixed:

- The educational nudge that participants read had a statistically significant (if not particularly striking) impact on attitudes to pensions. Those participants in the emotionally neutral group were more positive about pensions than all the other groups.
- The educational nudge that participants read had no statistically significant impact on intentions to start, or increase, pension saving.
- The educational nudge that participants read had no statistically significant impact on hypothetical behaviour.

(II) Fear Control Responses

As noted above, when confronted with a feared outcome there are two potential responses. One can either actively change behaviour to avoid the feared outcome (which is what the section above was attempting to measure). Alternatively, one can put one's head in the sand and deny or ignore the problem. It is this second response that is considered here.

Defensive avoidance: Participants were asked when they first hear about pensions was their first instinct to think about it nor not? Overall 61% of participants said that their first instinct was 'to think about it'. However, again no association was found between the educational nudge participants read and 'defensive avoidance'. The results of a chi-squared test of independence were: χ^2 (3, N = 418) = 1.40, p =.71. Next, they were asked: When you hear about pensions, does it make you want to do something about saving for your retirement or not? Overall 83% of respondents said they 'wanted to do something', and again there was no impact of the condition on this response: The results of a chi-squared test of independence were: χ^2 (3, N= 418) = 1.93, p =.597. While the educational nudge had no statistically significant impact on defensive avoidance, it was however clear that a large majority of participants did not self-report denial of the issue.

Derogation and Manipulation index: A derogation and manipulation index was created by summing the six responses to statements such as: "The message I just read was overblown/ exaggerated/ overstated/ manipulative/ misleading/ distorted". It was found to

be highly reliable (α = .92). There was a statistically significant impact of the educational nudge on the derogation and manipulation index, albeit not in the direction that the researcher anticipated. Those participants who were in the positive affect condition were most likely to reject the message, with a mean score of 22.9 compared to 17.4 for the fear group and 16.9 for the emotionally neutral group: $F(3,307) = 23.6$ $p < .001$. On one hand the positive affect message (which preaches an aggressively anti-consumerist message arguing that most middle-class people can and should spend less money) was associated with higher levels of self-reported positive affect, however clearly on average respondents found it more exaggerated than the other messages.

Table 7-3 *Means and standard deviations of the derogation and manipulation index as a function of educational nudge*

		Derogation and Manipulation index	
Condition	n	*M*	*Se (SD)*
Fear	104	17.44	.58 (5.91)
Positive affect	107	22.92	.78 (8.02)
Emotionally neutral	99	16.86	. 70 (7.00)
		$F(3,307) = 23.6$ $p < .000$	

Note: Derogation and Manipulation index scored 6 – 42 where higher scores represent more agreement that the message read was overblown/ exaggerated etc.

In sum with reference to the fourth hypothesis:

- The educational nudge that participants read had no statistically significant impact on defensive avoidance.
- The educational nudge that participants read had a statistically significant impact on the derogation and manipulation index. Participants who read the positive affect message were more likely to find the message was exaggerated.

(III) Subjective Value Placed on Occupational Pension

This part of the study sought to measure the impact that the educational nudges had on the subjective value respondents placed on different reward packages, where there was a trade-off between better pay or a better pension. This reflects the argument made throughout this thesis that employers will not be prepared to offer good pensions if individuals undervalue them. Three scenarios were presented to participants. The first asked them to compare

and rate two reward packages one with a defined benefit (DB) pension and one with a defined contribution (DC) pension. The second asked them to rate a series of three reward packages with DC pensions of increasing generosity. In both these cases the total cost to the employer was kept constant. In the third scenario participants were asked to choose between various financial packages where there was an incentive to defer (in that the more individuals chose to take pay in the form of a pension contribution, the higher was the total value of the reward package). In this case the total cost to the employer was not kept constant.

Comparing DB to DC pensions: A paired samples t-test indicated that, when comparing the two reward packages, participants placed a lower subjective value on a reward package with a more generous DB pension but lower pay (M = 62.70, SD = 18.76) than they did on a reward package with a less generous DC pension but higher pay (M =71.41, SD = 18.71), $t(417) = -7.06$, $p < .001$.

Table 7-4 *Results of t-test and descriptive statistics for attractiveness of job package*

	Low pay/DB pension		High pay/DC pension			95% CI for Mean Difference		
Outcome	*M*	*SD*	*M*	*SD*	n		*t*	df
	62.70	18.76	71.41	18.71	418	(6.28) – (11.13)	-7.06	417

* p < .05.
Note: attractiveness is scored from 0 – 100

To test whether the educational nudge that participants read had any impact on these ratings, a new variable was created, which was the difference between the ratings that each individual gave to the two job packages[97]. A positive number implies that an individual subjectively values a job package more highly if it offers better pay and a worse pension[98]. Conversely a negative figure implies that the individual places a higher value on a reward package with lower pay but better pension. While in general participants undervalued a DB pension (compared to the cost to the employer of providing it), the educational nudge

[97] Q21-Q20 called difference Q21-Q20
[98] For example, if a participant valued the package with the higher pay but worse pension at 70/100 and the lower pay but better pension at 60/100 then the difference would be 10.

that participants read had no statistically significant impact on the relative value they placed on the two reward packages: $F(3,414) = 0.79$ $p = .499$.

Table 7-5 *Means and standard errors of difference in perceived value of reward packages (i) comparing DB and DC, (ii) comparing DC only, and (iii) job choice with incentive to defer, all as a function of educational nudge*

		Difference DB v DC	Difference DC	Job choice
condition	n	*M (se)*	*M (se)*	*M (se)*
Fear	104	8.47 (2.40)	14.64 (2.46)	2.85 (.18)
Positive affect	107	9.95 (2.23)	11.07 (1.92)	2.57 (.17)
Emotionally neutral	99	10.78 (2.63)	14.84 (2.17)	2.80 (.18)
Control	108	5.80 (2.60)	10.41(2.39)	3.07 (.18)
total		$F(3,414) = 0.79$ $p = .499$	$F(3, 414) = 1.07$ $p = .36$	$F(3, 414) = 1.39$ $p = .244$

Note: Difference DB v DC is the difference in rating that participants gave to the two different reward packages. A positive number implies that the participant preferred the job with the higher pay but worse (DC) pension.
Note: Difference DC is the difference in rating that participants gave to the job with the lowest and highest DC pensions, a higher score here indicates that an individual values a job package more highly if it offers lower pay but a better pension.
Note: Job choice with incentive to defer is scored 1 – 7, where 1 = job package with most pay deferred and 7 = job package with least pay deferred

Comparing different DC pensions where there is a trade-off between better pay now, or a better pension later: This was a very similar question, except here participants were asked to say how attractive they found three different jobs all with DC pensions of varying generosity. Again, the total cost to the employer of all the packages was broadly the same. Here, in contrast, participants in general favoured a reward package that favoured pension rather than pay. Arguably this may be because the costs (or trade-offs) involved are more explicit and easily understood in a defined contribution pension. When comparing the reward package with the lowest pay and best pension with the job package with the highest pay and lowest pension a paired samples t-test showed that there was a statistically significant difference, $t(417) = 9.38$, $p < .001$.

Table 7-6 *Means and standard deviations of perceived attractiveness of the three reward packages where there was a trade-off between pay and a (DC) pension.*

	Attractiveness	
Reward package	*M*	*Se (SD)*
£35,400 plus pension of 3%	60.56	1.01 (20.73)
£33,200 plus pension of 10%	72.83	.88 (17.90)
£30,400 plus pension of 20%	73.67	1.14 (23.35)

Note: Attractiveness is scored 0 - 100

Table 7-7 *Results of t-test and descriptive statistics for attractiveness of job package (DC pensions)*

	Low pay/high pension (Q24)		High pay/low pension (Q22)			95% CI for Mean Difference		
Outcome	*M*	*SD*	*M*	*SD*	n		*t*	df
	73.67	23.35	60.56	20.73	418	(10.36) – (15.84)	9.38	417

* $p < .05$.
Note: attractiveness is scored from 0 – 100

Again, to see if the educational nudge had any impact on the difference in perceived value between the alternative reward packages a new variable was created[99]. Here it was coded so that a positive number implies that an individual subjectively values a job package more highly if it offers lower pay but a better pension. While participants in general valued a job package more highly if it offered the combination of a better (DC) pension but correspondingly lower pay the educational nudge had no statistically significant impact on the relative value they placed on the different reward packages: $F(3, 414) = 1.07$ $p = .36$ (see table 7.5 above).

Comparing job choice where there was an incentive to defer: The final question looked at the trade-off that people made between different reward packages where there *was* an incentive to defer. Here the more that individuals chose to defer their pay, the higher was the total value of the reward package, and it would be arguably 'irrational', or

[99] This variable, called '*Difference DC pension'* was created as follows: First the individual rating of the two job packages with the higher pensions was taken (as these had very similar means). Next the rating given to the job with the low pension was subtracted from this average. The resulting variable gives you an indication of the extent to which participants preferred the jobs with the higher pension but slightly lower pay. A positive number implies that individuals prefer the job with lower pay but a better pension.

at the very least impatient, to select a reward package that was not heavily weighted to a pension.

Measured with ordinal responses, from 1 – 7, a higher score represents a choice for higher pay, but a lower pension. Overall, the average score was 2.82 (which represents a choice for a pension of between 20% and 25%). So in general respondents expressed a preference for a relatively high pension, even when it meant a slight (but less than proportional) decrease in current salary. However the educational condition that the participants were in had no statistically significant impact on the relative value they placed on the different reward packages: $F(3, 414) = 1.39$ $p = .244$ (see table 7.5).

In sum, for this demographic, overall a DB pension destroyed value in the job contract, but in contrast a DC pension added value. With reference to the fourth hypothesis, the educational nudges had no statistically significant impact on this perception.

- When participants were comparing DB and DC pensions the educational nudge (fear, positive affect, emotionally neutral) had no impact on the subjective value placed on a reward package.
- When participants were comparing different levels of DC pension the educational nudge had no impact on the subjective value placed on a reward package.
- When there was an incentive to defer the educational nudge had no impact on the choice of reward package where there was a trade-off between pension and pay.

7.7.4 Mediation

The fifth hypothesis in this study was that the impact that the educational nudge (the IV) would have on pension engagement (the DV) would be mediated by expectancy, instrumentality and valence. Mediation, the attempt to explain why a relationship exists between antecedents and outcomes, has been traditionally tested for using the four-step method outlined in Baron and Kenny (1986). One of the issues with this method was that it required there to be a main effect (of the independent variable on the dependent variable) when there may be situations when one can have a non-significant main effect, while still showing significant mediation. A further issue has been the complication of testing for mediation with multi categorical independent variables. Hayes & Preacher (2014) note that one common work around (as popularised by Baron & Kenny 1986) has been to assess whether group differences on the dependent variable, as revealed with an analysis of

variance, disappear after controlling for a proposed mediator. Most recently Hayes (2018) has designed the PROCESS macro (version 3) to simplify the process of analysing mediation with multi categorical variables in SPSS based on regression analysis. This is the method that was used in this study to test for mediation.

To test for mediation on pensions engagement the outcome variable of the 'attitudes to pensions' index was chosen. It was selected as the single measure that best captured pension engagement. It was also one of the very first set of questions that was presented after the educational nudges (thus before response fatigue might have set in), and finally it was one of the few variables where there was a statistically significant main effect from the educational nudge (the other two aspects of 'danger control responses': intentions and hypothetical behaviour, had no significant association with the educational nudge).

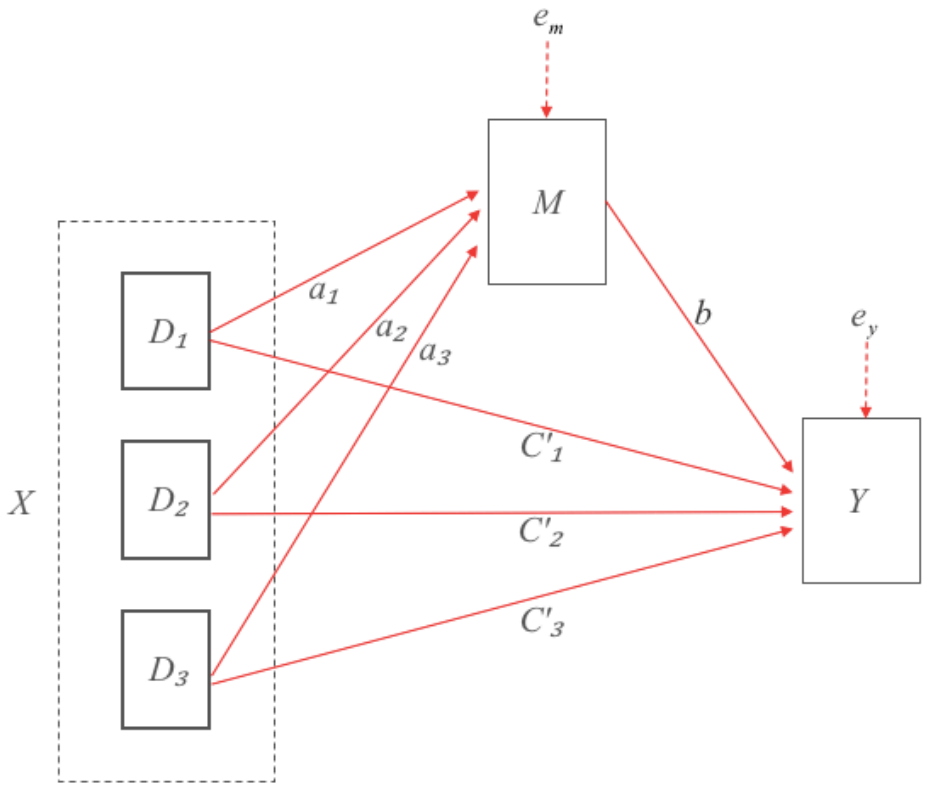

Figure 7-2 Statistical model

The statistical diagram of the mediation model. Where X is the experimental condition (coded so that D_1 = fear message, D_2 = positive affect message, D_3 = emotionally neutral message, the reference category is the control group). Y = attitudes to pensions. M = the

mediator. Expectancy, Instrumentality and valence[100] are tested separately as mediators (see appendix C.7 for notes on coding).

Mediation Expectancy

Expectancy is the belief that individuals have in their ability to perform a particular behaviour; in this case to save money in a pension. The expectancy scale consisted of 3 items ($\alpha = .815$). The question being asked here was whether the effect of the educational nudge on positive attitudes towards pensions is, at least in part, explained by its effect on people's attitudes towards how easy it is to save.

- X variable used was CONDNUM (the reference category is the control group, D_1 is the fear message, D_2 is the positive affect message and D_3 is the emotionally neutral message. Indicator coding was used.)
- Y variable used ATTPENS (measured from 3 to 21 where higher scores represent more positive attitudes to occupational pensions as a way to save for retirement).
- Mediator used EXPSCALE (measured from 3 – 21, where higher scores represent more belief in one's ability to save).

The following section explains in detail the procedure used following Hayes (2018). Subsequent descriptions of the results of tests for mediation do not describe all of these steps in as much detail.

The statistical diagram above (figure 7.2) represents the total effect of the educational nudge (X) on attitudes to pensions (Y) partitioned into its direct and indirect pathways. Inference of the indirect effects serve as the statistical test of mediation. The relative total effect (c_j) is equal to the sum of the relative direct effect (represented by pathways c_j') and the relative indirect effect (the product of pathways a_j and b).

The first step in assessing mediation is to regress attitudes to pensions on the experimental condition, i.e. which educational nudge participants read (equation 7.1). This gives you the relative total effect of X on Y when the mediator (expectancy) is not included in the model. Consistent with the earlier findings, the resulting regression model was statistically significant with $R^2 = .038$, $F(3,414) = 5.47$, $p = .001$ (see table 7.9).

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[100] The conditions were dummy coded into a variable called CONDNUM. The scales are labelled EXPSCALE.

Attitudes to pensions = 16.481 + 0.019 (dummy fear) - 0.276 (dummy positive affect) + 1.488 (dummy emotionally neutral) (7.1)

Table 7-8 *Descriptive statistics for attitude to pensions, and expectancy by experimental condition*

		M	Y
		EXPSCALE	ATTPENS
Fear message (D_1)	*Mean*	10.35	16.50
	SD	4.34	3.93
Positive affect message (D_2)	*Mean*	12.15	16.21
	SD	4.52	3.47
Emotionally neutral message (D_3)	*Mean*	10.52	17.97
	SD	4.63	2.71
Control group (reference category)	*Mean*	10.28	16.48
	SD	4.63	3.47
Total	*Mean*	10.83	16.78
	SD	4.58	3.49

Note: Expectancy scale (EXPSCALE) is scored from 3 – 21 where higher scores represent a stronger belief in one's ability to save money in a pension.
Note: Attitudes to pensions (ATTPENS) is scored from 3 to 21 where higher scores represent more positive attitudes towards pensions.

In the total effect model only the coefficient for the dummy variable (D_3) for the emotionally neutral group was individually significant (see table 7.9 below).

The relative total effects partition into the relative direct and relative indirect effects. To calculate these, two further regressions are carried out. First the mediator expectancy (EXPSCALE) is regressed onto the experimental condition to get the paths a_1, a_2 and a_3 (see equation 7.2). Then attitudes to pensions (ATTPENS) is regressed onto both the experimental condition and the mediator expectancy. This yields the coefficients for the pathways c'_1, c'_2 and c'_3, and b (see equation 7.3).

The model for expectancy regressed onto experimental condition (pathway a_1, a_2 and a_3.) was statistically significant, $R^2 = .029$, $F(3,414) = 4.11$, $p = .007$. Here the individual coefficients for pathway 'a' represent the mean difference in (M) expectancy

between each group (X) compared to the reference category (the control group). In this case only the coefficient for the positive affect group was statistically significant (see table 7.9 below). Those in the positive affect group had mean scores on expectancy that were 1.87 higher than the control group.

EXPSCALE = 10.278 + 0.068 (dummy fear) + 1.872 (dummy positive affect) + 0.237 (dummy emotionally neutral) (7.2)

Finally the model for attitudes to pensions that includes both the experimental condition, and the mediator (expectancy) was estimated, $R^2 = .106$, $F(4,414) = 12.24$, $p < .001$ (equation 7.3). These regression coefficients for D1, D2 and D3 are estimates of pathway c'. These are the relative direct effects of X on Y, controlling for M. This is done by setting M to the sample mean (Hayes, 2018). This is equivalent to a one-way analysis of covariance with expectancy as the covariate. The equation also produces an estimate of b, the effect of expectancy on attitudes to pensions among participants who were in the same group. People who were one unit higher in expectancy had a score of 0.2 units higher in attitudes to pensions (where higher scores are more positive).

Attitudes to pension = 14.413 + 0.005(dummy fear) - 0.653(dummy positive affect) + 1.440 (dummy emotionally neutral) + 0.201(expectancy) (7.3)

Table 7-9 *Regression coefficients, standard errors, and model summary information for attitudes to pensions mediation analysis with expectancy as the mediator.*

		Consequent									
		Y(ATTPENS)				M(EXPSCALE)				Y(ATTPENS)	
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
D_1 (fear)	c_1	.019	.472	.969	a_1	.068	.623	.913	c'_1	.005	.455	.992
D_2 (positive affect)	c_2	-.276	.468	.556	a_2	1.872	.618	.003	c'_2	-.653	.457	.154
D_3 (emotionally neutral)	c_3	1.488	.478	.002	a_3	.237	.631	.707	c'_3	1.440	.461	.002
M(EXPSCALE)		-	-	-		-	-	-	b	0.201	.036	<.001
Constant	i_y	16.481	.330	<.001	i_M	10.278			i_y	14.413	.488	<.001
		$R^2 = .038$				$R^2 = .029$,				$R^2 = .106$		
		$F(3,414) = 5.465$, $p = .001$.				$F(3,414) = 4.113$, $p = .007$.				$F(4,414) = 12.241$, $p =$<.001		

To summarise:

The relative total effect of the experimental condition on attitudes to pensions can be portioned into the relative direct effect and the relative indirect effect. That is $c_1 = c'_1 + a_1b$, $c_2 = c'_2 + a_2b$ and $c_3 = c'_3 + a_3b$.

Paths a_1, a_2 and a_3: show the relative direct effect of the experimental condition on the mediator (expectancy). This found a statistically significant effect for those in the positive affect group, where those who were in the positive affect group were predicted to have an increase in positive attitudes to pensions of 1.87 points compared to the control group

Paths c'1, c'2 and c'3: show the relative direct effect of the experimental condition on attitudes to pensions when the mediator (expectancy) is set to the group mean. This showed that, holding expectancy constant, those in the emotionally neutral group were predicted to score 1.44 points higher on the attitudes to pensions scale.

Path b: is the regression coefficient for the effect of the mediator (expectancy) on Y (attitudes to pensions). This quantifies how much two cases that differ by one unit on expectancy, but were in the same experimental condition, are estimated to differ in their attitudes to pensions. Here, among those who read the same educational nudge, those who score one unit higher on the expectancy scale, are predicted to score 0.201 units higher on attitudes to pensions (where higher scores mean you are more positive).

Test of mediation***:*** The test of mediation in this model comes from an estimate and test of the indirect effect of the experimental condition on attitudes to pensions through expectancy. The relative indirect effect of each group (i.e. those who read the fear, positive affect, or emotionally neutral message) compared to the control group is calculated as a_1b, a_2b and a_3b. In other words, they are the products of the two regression coefficients 'a' and 'b'. As the sampling distribution of two regression coefficients is not normal, PROCESS is used to estimate 95% bootstrap confidence intervals (based on 5,000 bootstrap samples). If at least one of the resulting confidence intervals does not contain zero, then there is evidence that the impact of the educational nudge on attitudes to pensions is mediated by expectancy.

The results of the confidence intervals for the relative indirect effect of X on Y are in table 7.10 below. These show that mediation was present only for the group that were randomized to read the positive affect message (D_2). In sum, there is evidence to support the hypothesis that the effect of the messages will be mediated by expectancy for those who read the positive affect message.

Table 7-10 *Bootstrap confidence intervals for the relative indirect effects of experimental condition on attitudes to pensions with expectancy as a mediator*

	Relative indirect effects of experimental condition on attitudes to pensions			
	effect	BootSE	BootLLCI	BootULCI
D_1 (fear)	0.0138	.1276	-.2301	.2862
D_2 (positive affect)	.3767	.1516	.1163	.7112
D_3 (emotionally neutral)	.0478	.1328	-.2077	.3314

Note: The indirect effect is calculated as the product of a_jb. As the sampling distribution of two regression coefficients is not normal, inference is done through confidence intervals. (Hayes, 2018 p.2101)

Mediation Instrumentality

The same process was carried out with instrumentality as a mediator. Instrumentality is related to issues such as trust in the system and understanding of the correlation between performance and outcomes. The instrumentality scale was made up of 5 items ($\alpha = .75$). The question being asked here was whether instrumentality at least in part explains the impact of the educational nudge on attitudes to pensions. The statistical diagram follows the same form as that for expectancy. As before PROCESS was used to estimate the model of mediation.

- X variable used was CONDNUM (the reference category is the control group, D_1 is the fear message, D_2 is the positive affect message and D_3 is the emotionally neutral message. Indicator coding was used.)
- Y variable used ATTPENS (attitudes to pensions, measured from 3 to 21 where higher scores represent more positive attitudes to occupational pensions as a way to save for retirement).
- Mediator used 'INSTSCLE (instrumentality measured from 5 – 35, where higher scores represent more belief and trust in the pension system).

Table 7.11 below sets out the results of the regression coefficients, standard errors and model summary information. As before, as can be seen from the first column (where the coefficients are labelled c) when looking at the total effect, only those in the emotionally neutral group had any statistically significant increase in positive attitudes to pensions. Again, the total effect of the experimental condition on attitudes to pensions can be

portioned into the relative direct effect (paths c'1, c'2 and c'3) and the relative indirect effect (which is the product of the two regression coefficients a and b).

Pathways labelled 'a' calculate the association between experimental condition and instrumentality. The results (table 7.11 below) show that participants who read the positive affect message and the emotionally neutral message, compared to the control group, had statistically significantly higher levels of trust and belief in the pension system (specifically their respective means were 1.22 and 1.69 higher than the control group). This was not the case for the fear message.

Pathway b represents the effect of instrumentality on attitudes to pensions. It tells you that, among those who were in the same condition (i.e. read the same educational nudge) that those who scored one unit higher on instrumentality scored .38 higher on positive attitudes to pensions. In other words, perhaps unsurprisingly, those with higher faith and trust in the system were more positive about pensions.

Finally, pathways c' represents the relative direct effects of X on Y, when instrumentality is held constant (i.e. is set to its sample mean). In other words it quantifies the estimated difference in attitudes to pensions (Y) between each case, compared to the control group, holding instrumentality constant. In this case those in the emotionally neutral group were estimated to have a score on attitudes to pensions of .84 higher than the control group, when controlling for instrumentality.

Test of mediation: As before, the test of mediation in this model comes from an estimate and test of the indirect effect of the experimental condition on attitudes to pensions through instrumentality. The relative indirect effect of each group (i.e. those who read the fear, positive affect, or emotionally neutral message) compared to the control group is calculated as a_1b, a_2b and a_3b. The results of the confidence intervals for the relative indirect effect of X on Y are in table 7.12 below. These show that mediation was present for both the group that read the positive affect message and the emotionally neutral message, as the confidence intervals did not contain zero. In sum, there is evidence to support the hypothesis that the effect of the messages will be mediated by instrumentality for these participants who read the positive affect and emotionally neutral message.

Table 7-11 *Regression coefficients, standard errors, and model summary information for attitudes to pensions mediation analysis with instrumentality as a mediator*

		Consequent									
		Y(ATTPENS)				M(INSTSCLE)				Y(ATTPENS)	
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
D_1 (fear)	c_1	.019	.47	.9687	a_1	.78	.58	.1804	c'_1	-.28	.42	.5033
D_2 (positive affect)	c_2	-.28	.47	.5560	a_2	1.22	.57	.0347	c'_2	-.74	.42	.0745
D_3 (emotionally neutral)	c_3	1.49	.48	.0020	a_3	1.69	.59	.0041	c'_3	.84	.43	.0498
M(INSTSCLE)		-	-	-		-	-	-	b	.38	.04	.0000
Constant	i_y	16.48	.33	.0000	i_M	23.18	.40	.0000	i_y	7.58	.87	.0000
		$R^2 = .04$				$R^2 = .02$				$R^2 = .25$		
		$F(3,414) = 5.46$,				$F(3,414) = 3.05$,				$F(4,414) = 34.71$,		
		$p = .0011$				$p = .0286$				$p = <.001$		

Note: c represents the total effect, c' is the relative direct effect, a and b multiplied are the relative indirect effects

Table 7-12 *Bootstrap confidence intervals for the relative indirect effects of experimental condition on attitudes to pensions with instrumentality as a mediator*

	Relative indirect effects of experimental condition on attitudes to pensions			
	effect	BootSE	BootLLCI	BootULCI
D_1 (fear)	.2981	.2213	-.1303	.7590
D_2 (positive affect)	.4673	.2333	.0406	.9458
D_3 (emotionally neutral)	.6502	.2345	.2082	1.1360

Note: The indirect effect is calculated as the product of $a_j b$. As the sampling distribution of two regression coefficients is not normal, inference is done through confidence intervals.

Mediation Valence

The same process was carried out with valence as a mediator. Valence is the extent to which a person values a given outcome and reward and was measured by asking to what extent people want to smooth their income over their lifetime. Again the statistical diagram follows the same form as that for expectancy.

- X variable used was CONDNUM (the reference category is the control group, D_1 is the fear message, D_2 is the positive affect message and D_3 is the emotionally neutral message. Indicator coding was used.)
- Y variable used ATTPENS (measured from 3 to 21 where higher scores represent more positive attitudes to occupational pensions as a way to save for retirement).
- Mediator used 'VALNCE' (measured from 1 - 6 where higher scores represent a desire for an income profile that increases with retirement)

In this case there was no evidence for valence as a mediator. The full details of the process output are not reported here but are in the appendix C.5. While the impact of the educational nudge on valence (path a) was statistically significant for the group that read the positive affect message, all of the confidence intervals for the relative indirect effects of the experimental condition on attitudes to pensions through valence as a mediator contained zero (table 7.13). In sum, there was no statistical support for the hypothesis that valence mediated the relationship between the experimental manipulation and positive attitudes to pensions.

Table 7-13 *Bootstrap confidence intervals for the relative indirect effects of experimental condition on attitudes to pensions with valence as a mediator*

	Relative indirect effects of experimental condition on attitudes to pensions			
	effect	BootSE	BootLLCI	BootULCI
D_1 (fear)	.0035	.0436	-.0961	.0945
D_2 (positive affect)	.0857	.0722	-.0450	.2463
D_3 (emotionally neutral)	.0130	.0434	-.0767	.1094

Note: The indirect effect is calculated as the product of $a_j b$. As the sampling distribution of two regression coefficients is not normal, inference is done through confidence intervals.

In conclusion with reference to the fifth hypothesis, there is some evidence of statistically significant mediation. Looking at expectancy, instrumentality and valence in turn:

- Expectancy was found to mediate the relationship between the positive affect message and attitudes to pensions.
- Instrumentality was found to mediate the relationship between the positive affect and emotionally neutral message and attitudes to pensions.
- However, there was no support found for the hypothesis that valence mediates the relationship between the educational nudge and attitudes to pensions

It should be noted that while the evidence of mediation is statistically significant for expectancy and instrumentality, it would be a stretch to say that these results are meaningful. The size of the effect on self-reported attitudes can reasonably only be described as modest.

7.7.5 Moderation

This section tests for the moderation effect of fear. Mediation as outlined above, tests for *why* a particular relationship between predictor and outcome occurs. For example, it tests for the hypothesis that the reason the educational nudges impact on pensions engagement is through their impact on valence and instrumentality. Moderation seeks to explain *when* or *for whom* the relationship between predictor and outcome occurs.

It should be noted that fear was not originally included in the study as a potential moderator. It was hypothesised that the fear message would lead to higher levels of fear about pension saving which would then explain why the measured outcomes of pension

engagement would be impacted. However, as fear in this study (and also in the subsequent study discussed in the next chapter) was a relatively stable attribute, remaining consistently high across all conditions, it seemed appropriate to test it as a moderating variable. In other words, the hypothesis being tested here is not that the fear message generates higher fear thus resulting in more positive attitudes to pensions. Rather, that those individuals who are higher in fear when it comes to thinking about their pension in general, may respond in different ways to the educational nudges.

The Statistical Model: As before the dependent variable considered here is the attitudes to pensions index[101]. The independent variable is the educational nudge[102] that participants were randomised to read, and the moderator (M) is fear (as reported through the fear index[103]). Following Hayes & Montoya (2017) indicator or dummy coding for the experimental condition was used, where D_1 = fear message, D_2 = positive affect message, D_3 = emotionally neutral message, with the control group as the reference category[104]. A constrained model of no interaction is

Attitudes to pensions = $B_0 + B_1$ (dummy fear) + B_2 (dummy positive affect) + B_3 (dummy emotionally neutral message) +B_4 (moderator: fear index) (7.4)

Allowing for interaction (i.e. allowing the differences in means represented by the dummy coding system to vary linearly with M) the model is

Attitudes to pensions = $B_0 + B_1$ (dummy fear) + B_2 (dummy positive affect) + B_3 (dummy emotionally neutral) +B_4 (moderator: fear index) + B_5 (dummy fear message) (moderator: fear index) + B_6 (dummy positive affect) (moderator: fear index) + B_7 (dummy emotionally neutral) (moderator: fear index) (7.5)

The interaction terms estimate how much the effect of the IV in question (the educational nudge read) on Y (attitudes to pensions) changes as M (fear) changes by one unit. For example, if B_5 D_1M is zero then D_1's effect on Y is not dependent on M. The coefficients

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[101] ATTPENS
[102] CONDNUM
[103] FEARIND
[104] CONDNUM

for the IVs ($D_1 - D_3$) represents their conditional effects on the outcome Y when M = 0. (Hayes & Montoya, 2017).

Without considering the impact of fear as a moderator a one-way analysis of variance, as reported above, revealed a significant effect of educational nudge on attitudes to pensions, $F(3, 414) = 5.47$ $p = 0.001$. Those in the emotionally neutral group were more positive about pensions than all the other groups. A test of moderation was undertaken through a model comparison approach. This is done by comparing the fit of the model in equation (7.4) and (7.5) by computing the difference between their squared multiple correlations. (Hayes and Montoya 2017, Field A. 2015)

The results showed that, as should be expected, the regression coefficient for the dummy variable for the emotionally neutral group (D_3) was statistically significant, b = 1.428, 95% CI [0.5641, 2.2927], $t = 3.25$, $p = .0013$.

However, while the overall model was statistically significant, $R^2 = .06$, $F(7,410) = 4.27$, $p = .0001$, moderation was not found. Moderation is shown up by a significant interaction effect, and in this case, the regression coefficient for the interaction terms for all three groups (fear, positive affect and information) was non-significant. That is, the impact of the educational nudge on attitudes to pensions did not differ according to participants levels of fear.

Fear* fearindex: $b = 0.1020$, 95% CI [-0.3318, 0.5357], $t = .4621$, $p = .6443$

Positive affect*fearindex: $b = 0.2196$, 95% CI [-.2361, 0.6752], $t = 0.9474$, $p = .3440$

Information*fearindex: $b = 0.1180$, 95% CI [-0.3057, 0.5417], $t = 0.5475$, $p = .5843$

Further the R –square increase due to interaction of 0.0057 was not significant, $F(3,410) = 0.34$, $p = .7997$ (The full results are in appendix C.6).

7.7.6 Discussion

This chapter asks if financial communication can improve pension engagement. The UK government has restricted its role to providing poverty relief in retirement, and few employers see any commercial incentive to provide occupational pensions above the legal minimum. Can education help the young make the right choices?

It sought to address two research gaps in the literature on financial education and pension engagement. First it wanted to recast the problem of whether people are saving 'enough' for their retirement by also looking at job choice. Arguably your job choices will have a much larger impact on your later financial health than the decision to save a few percent more or less. More broadly, if individuals do not understand enough about pensions to value them, then there will be no incentive for an employer to provide them. 'Nudge' techniques have had their most high-profile successes in the field of pension saving. However, their very reliance on inertia, is both a weakness as well as a strength. Nudges such as auto enrolment accept preferences, where education strategies aim to transform preferences (John et al., 2009). To put this argument in context, the recent roll out of pension auto enrolment has been hailed as a huge success. However, the amounts that people are contributing under auto enrolment minimums (currently 1% of banded earnings from both employer and employee) are likely to provide a disappointing pension.

Second this experiment sought to look at the impact of affect on choices. While emotions are often viewed as a negative corrupting influence they can also have a more positive effect – namely to provide the motivation necessary to pursue the chosen course of action.

The results of this investigation into the impact of an educational intervention do not support the idea of financial education as a panacea. None of the three educational nudges were associated with a strong increase in pension engagement. Pension engagement was measured with three groups of dependent variables: Danger control responses, fear control responses, and subjective value placed on an occupational pension. The impact of the educational nudge on danger control responses (attitudes, intentions and hypothetical behaviour) was mixed: The emotionally neutral message had a statistically significant (if not particularly strong) positive impact on attitudes to pensions. There was no significant impact on intentions or hypothetical behaviour. Regarding fear control responses (the extent to which people prefer to ignore the message), the messages participants read had no impact on the extent to which people choose to avoid thinking about pensions, however the positive affect message was regarded as more exaggerated or misleading than the other messages.

When looking at the extent to which participants value an occupational pension, while in general defined benefit pensions were 'undervalued' (compared to the cost of providing them), defined contribution pensions were more attractive. However again the education nudge made no difference to these preferences.

There was evidence that the relationship between the educational nudge and attitudes to pensions was mediated by expectancy and instrumentality. However, there was no evidence that valence mediated the relationship. Nor was there any evidence that fear moderated the relationship between the experimental condition and attitudes to pensions.

To conclude, while there were a few statistically significant effects, they tended to be weak and did not offer strong evidence that financial education, and specifically an appeal to emotions, holds the key to transforming pension engagement. This study had as its demographic a young age group (ages 22 to 32). The next chapter goes on to repeat this study with an older pool of subjects among who one might expect, a priori, that pension concerns are more salient.

8 Experiment 3

8.1 Introduction

Chapter 7 investigated whether brief educational nudges could impact pension engagement. It used a participant pool made up of millennials – arguably those with least inclination to think about pensions, but most in need of help. This chapter repeats the experiment with an older pool of participants. Would the earlier results be replicated, or might pension education fall on more fertile ground with a slightly older, and on average richer, demographic? In this experiment participants were aged between 33 and 43. As before participants were randomly allocated to read one of (the same) three short messages that contained information relating to pensions and saving. As before one message was designed to generate fear, one was designed to trigger positive affect, and one was emotionally neutral containing only information. The fourth group was the control group and received no message. All participants were then asked a series of questions to measure pension engagement. All questions were as in the study in chapter 7 (see appendix D.1) with the exception of a few changes, the details of which are explained more fully below.

8.2 Model and Hypotheses

The model and the hypotheses remain the same as in chapter 7. As before, the research question was to examine whether messages designed to appeal to the heart or the head were more effective at increasing pension engagement. It was again hypothesised that the effect of the messages would be mediated by expectancy, valence, and instrumentality.

8.3 Methods

8.3.1 Participants and Design

N=417 participants were paid £2.50 and were recruited through Prolific. They were pre-screened to be aged 33 – 43, not a student, in full or part time work and resident in the UK. There was an attention filter, and participants who incorrectly answered this question were excluded from the analysis. An alpha level of 0.05 was used for all statistical tests. The messages used were the same as in chapter 7.

8.3.2 Measures

All measures used were the same as in chapter 7, apart from three changes:

Hypothetical behaviour: In the study in chapter 7 participants were presented with a hypothetical scenario in which they had to imagine that they had just started a job and had been asked if they would like to make additional contributions to their pension. The responses were categorical (yes/no/I don't know). In this third experiment, in an attempt to obtain a more fine-grained response, a similar hypothetical situation was posed, but respondents were asked (in percentage terms) how much of their salary they would choose to allocate to a pension. For example, 1 = I would put nothing into my pension and 7 = I would put more than 20% of my salary into my pension. (Options were: 0%, 1 – 4%, 5 – 8%, 9 – 12%, 13 – 16%, 17 – 20%, more than 20%). In this case the response was ordinal and was treated as a continuous variable in subsequent analysis.

Pay levels used in job choice questions: As before there were three questions that asked participants to state the subjective value they placed on different reward packages where there was a trade-off between pay and pension. The pay figures used on all these questions were increased to reflect the higher earnings typical of this group. Again pay levels were selected with reference to pay data from the Office of National Statistics. See appendix D.2 for details of the earnings percentiles used to inform the figures in the question.

Positive affect: A shortened measure for positive affect was measured. This was to reduce participant fatigue. A reduced version of the PANAS scale (Watson et al. 1998) was used which shortened the 10-item scale to 4 items (scored on a scale of 1 – 5, where 1 = very slightly or not at all, and 5 = extremely). The reduction was done following Crawford & Hendy 2004, as described by Thomson (2007), that showed that the 10 items of the PA scale form into four groups whose constituent items respectively share variance: Two groups contain three covarying items (interested, alert, attentive) and (excited enthusiastic, inspired). Two groups contain two covarying items: (proud, determined) and (strong and active). Consequently, one adjective was selected from each group of these four groups that most closely related to financial choices.

8.4 Results

This section proceeds as follows: First, a brief outline is given of the descriptive statistics. Next follows the results of the main effect of the educational nudge the participant read on fear, positive affect and knowledge (the first three hypotheses). Then the main effect of the experimental condition on the outcome variables of pension engagement is reported (the fourth hypotheses). Then the impact of the mediators on the relationship between

experimental condition and pension engagement is discussed (the fifth hypotheses). Finally, the moderating effect of fear is described.

8.4.1 Descriptive Statistics

The average age of participants was 37 and 49% were male. In terms of income 66% earned under £29,999. An additional question was included regarding employment status: 67% were full-time, 20% part-time and 12% self-employed. General awareness of their own pension situation was a bit better than with the younger group in experiment 2, but it was still rather low. Just over 65% of participants were saving in a pension. Of those, 22% (compared to 15% in experiment 2) were in a defined benefit pension, 57% said they were in a defined contribution (compared to 56% in experiment 2), and 22 % (compared to 30%) said they did not know which type of pension they had. Just under 34% of people did not know how much their employer put into their pension (compared to 50%) and 26% of participants (compared to 45%) did not know how much they were putting into their pension.

8.4.2 Effect of Educational Nudge on Fear, Positive Affect and Knowledge

This section looks at the main effect of the educational nudge on fear, positive affect and knowledge.

Fear: As before fear was measured in two alternative ways. First it was measured with the threat index (Cronbach's alpha .735) and the fear index (Cronbach's alpha .826). The results of a one way analysis of variance showed that the condition into which the participants were allocated had no significant impact on levels of perceived threat as measured using the threat Index, $F(3,413) = .37$ $p = .776$. Similarly, the condition again had no significant impact on perceived fear as measured with the fear index $F(3,413) = .41$, $p = .745$ (see table 8.1)

The second way in which fear was measured was with the negative mood index (Cronbach's alpha .914). Here the condition into which participants were allocated had a statistically significant impact on negative mood, $F(3,413) = 33.69$ $p < .001$. Those participants who read the message designed to trigger fear reported the highest levels of

negative mood (*M*= 7.34, *se* = .35 report se) compared to *M* = 3.89 *se.15* for those in the control group[105].

In sum, the educational nudge had no impact on the threat index or the fear index (as in experiment 2). Arguably this could be because people are already worried enough about their pensions and reading yet another depressing article about how much they should be saving does little to make this any worse. However, the educational nudge read *did* have a significant impact on negative mood, with the overall pattern very similar in both studies.

Positive affect: Positive affect was measured using a reduced version of the PANAS scale (Watson et al. 1998). Cronbach's alpha = .84. Here, in contrast to the results in chapter 7, the condition into which participants were allocated had no significant impact on positive affect: $F(3,413) = 1.02$ $p = .384$ (see table 8.1).

Pension knowledge: In this older group, perhaps surprisingly, the general level of pension knowledge was not much better than in experiment 2 with the younger pool of participants. Out of four questions, the average correct score was 1.53 (compared to 1.3 in experiment 2). In brief, 52% (compared to 39% in experiment 2) knew that a DB pension was better. Only 25% (compared to 24% in experiment 2) knew what the correct level of tax relief was on pension contributions. Only 26% (compared to 24% in experiment 2) could correctly identify the tax free lump sum you were able to take from your pension at retirement (52% selected the 'don't know option'). About half of the participants, however, were able to correctly identify the amount of the Basic State Pension (compared to 47% in experiment 2) and almost no one selected an amount higher than £189 per week (only 6 people or 0.14 of the sample chose a higher amount). This suggests that while there might be some confusion about the exact level, most people are very well aware that the state pension in the UK is far from generous. They are however very largely in the dark about the potential tax advantages of pension saving.

Did the communication nudge that participants were allocated to read have any impact on this score? Here, as with the younger group, there was a statistically significant result. In a one-way ANOVA estimated using SPSS Generalized Linear Model the

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[105] Note that in experiment 2 the negative mood index is made up of three items scored from 1 – 7. While in experiment 3 it was made up of three items scored 1 – 5.

Table 8-1 *Means and standard errors of the threat index, fear index, negative mood index, positive affect index and pension knowledge as a function of educational nudge.*

		Threat index	Fear index	Negative mood index	Positive affect index	Pension knowledge
condition	n	*M(se)*	*M(se)*	*M(se)*	*M(se)*	*M(se)*
Fear	99	33.05 (.58)	17.11 (.35)	7.34 (.35)	12.01 (.38)	1.46 (.10)
Positive affect	106	33.08 (.50)	17.19 (.31)	4.67 (.23)	12.57 (.37)	1.24 (.10)
Emotionally neutral	105	32.54 (.56)	17.56 (.29)	5.06 (.26)	12.32 (.33)	2.07 (.11)
Control	107	33.28 (.44)	17.22 (.29)	3.90 (.15)	11.78 (.32)	1.36 (.11)
total		$F(3,413) = .37$ $p = .776$	$F(3,413) = .41$, $p = .745$	$F(3,413) = 33.69$ $p < .000$	$F(3,413) = 1.02$ $p = .384$	$F(3,413) = 12.19$, $p < .000$

Note: Threat index is scored from 6 - 42 where higher scores represent a higher perception of threat.
Note: Fear index is scored from 3 - 21 where higher scores represent more fear.
Note: Negative mood index is scored from 3 – 15 where higher scores represent a more negative mood.
Note: Positive affect index is scored from 4 – 20 where higher scores represent higher positive affect.
Note: Pension knowledge is scored from 0 to 5 where higher scores represent better knowledge.

communication nudge that participants were allocated to read had a statistically significant impact on pension knowledge, $F(3,413) = 12.19$, $p < .001$. Perhaps unsurprisingly those who read the emotionally neutral message which had the heaviest focus on information scored most highly ($M = 2.07$, $se = .11$) compared to $M = 1.36$, $se = .11$ in the control group. (See table 8.1). In both studies financial information improved knowledge (but whether it also 'improves' behaviour is a very different matter). In both studies knowledge about the tax incentives of pensions was very low

In sum the three messages tested (fear, positive affect and emotionally neutral) had respectively a mixed effect on fear, no statistically significant impact on positive affect, and a statistically significant effect on pension knowledge. Regarding the first three hypotheses:

- The fear message had no impact on fear as measured using the threat and fear indexes. However, when fear was measured using the negative mood index, the fear message had a statistically significant impact on negative mood with those participants who read the fear message having the highest level of negative mood, and those in the control group the lowest.
- The positive affect message had no impact on positive affect as measured using the positive affect index.
- The emotionally neutral message had a statistically significant effect on knowledge. Those participants who read the emotionally neutral message had the highest level of knowledge.

8.4.3 Main Effect of the Educational Nudge on Pension Engagement

As before there were three dependent variables: 'danger control responses' which are made up of attitudes, intentions and hypothetical behaviour towards pensions; 'fear control responses' which capture extent to which a message, rather than driving changes in behaviour, will provoke a 'head in the sand approach' of ignoring or rejecting the message; the subjective value placed on different reward packages where there is a trade-off between pay and pension.

(I) Danger Control Responses

Attitudes: As before, the 'attitudes to pension index' was made up from three items measured on a scale of 1 -7. Cronbach's alpha was .914 demonstrating good internal reliability. As with the study in chapter 7, generally most participants were very positive

about pensions, and again the educational nudge that the participants read had a significant (if again not particularly striking) impact on attitudes to pensions. In a one way analysis of variance estimated using SPSS Generalized Linear Model: $F(3, 413) = 4.25$ $p = 0.006$. As with experiment 2, those in the emotionally neutral group were more positive about pensions than all the other groups, $M = 17.97$, $se = .28$, compared to the control group, $M = 16.53$, $se = .40$ (see table 8.2).

Intentions: This was measured by asking participants to report how likely they were to either start, or increase, their pension saving. In general participants were not particularly positive about either increasing their saving, or starting to save. As with experiment 2, a one-way analysis of variance using SPSS Generalized Linear Model showed no statistically significant difference according to condition $F(3,270) = 1.14$, $p = .334$ and $F(3,139) = 1.00$, $p = .393$ respectively.

Hypothetical behaviour: Here participants were asked to make a hypothetical choice about how much they would choose to pay into a pension. In contrast to experiment 2 where the outcome was categorical, in this case respondents were asked how much (in percentage terms) of their salary they would choose to allocate to a pension. The response was ordinal and treated as a continuous variable in the analysis.[106]

Here the educational nudge that the participants read had a significant (if not particularly striking) impact on hypothetical behaviour to pensions. A one-way analysis of variance estimated using SPSS Generalized Linear Model showed that there was a statistically significant impact of the educational message read on hypothetical behaviour, $F(3, 413) = 2.87$ $p = 0.036$. Here it was the group that read the fear message that chose to allocate the highest amount to their pension.

To summarise, the emotionally neutral nudge was associated with a significant (if small) increase in positive attitudes to pensions. The educational nudge had no impact on self-reported intentions to save; however, there was an impact of the educational nudge on hypothetical choices. Those in the fear group contributed the most, with those in the

[106] Note: Q14 was in error scored 2 – 8 (rather than 1 – 7). I recoded this (called Q14_recoded) so it was scored 1 -7.

Table 8-2 *Means and standard errors of the 'danger control responses' (attitudes, intentions and hypothetical behaviour) as a function of educational nudge*

		Attitudes		Intentions to increase saving		Intentions to start saving		Hypothetical behaviour
condition	n	*M(se)*	n[a]	*M(se)*	n[b]	*M(se)*	n[c]	*M(se)*
Fear	99	16.65 (.39)	61	3.70 (.25)	38	4.21 (.32)	99	4.84 (.17)
Positive affect	106	16.40 (.34)	74	3.47 (.21)	32	4.09 (.35)	106	4.36 (.19)
Emotionally neutral	105	17.97 (.28)	71	3.65 (.19)	34	4.68 (.28)	105	4.15 (.16)
Control	107	16.53 (.40)	68	3.18 (.23)	39	3.92 (.33)	107	4.36 (.16)
total		$F(3, 413) = 4.26$ $p = .006$		$F(3,270) = 1.14$, $p = .334$		$F(3,139) = 1.00$, $p = .393$		$F(3, 413) = 2.87$ $p = .036$

Note: attitudes to pension index is scored from 3 to 21.

Note: Intentions to start and intentions to increase pension saving were both measured on a scale of 1 – 7, where 1 = extremely unlikely, and 7 = extremely likely.

Note: Hypothetical behaviour was measured with an ordinal variable where 1 = I would put nothing into my pension and 7 = I would put more than 20% of my salary into my pension.

Note: n[a] Only those participants who said that they were not already saving in a pension saw this question.

Note: n[b] Only those participants who said that they were already saving in a pension saw this question

Note: n[c] This question was asked of all the participants.

neutral group the least. Regarding the fourth hypothesis (as it relates to danger control responses):

- The educational nudge that participants read had a statistically significant (if not particularly striking) impact on attitudes to pensions. Those who read the emotionally neutral message were more positive about pensions than the other groups.
- The educational nudge that the participants read had no statistically significant impact on intentions to start, or increase, pension saving.
- The educational nudge that participants read had a statistically significant impact on hypothetical behaviour towards pensions. Those who read the fear message chose to allocate the highest amount to their pension

(II) Fear Control Responses

As noted in the literature on fear, messages triggering fear, rather than resulting in changes of behaviour, can sometimes merely result in rejection of the message.

Defensive avoidance: As before, participants were asked two questions. The first question was whether their first instinct is to think about pensions or not. The second question was does hearing about pensions make you want to do something about your pension or not. In general, and in common with experiment 2, most participants did not seem to want to avoid the issue: 66% of the participants replied that their first instinct was to think about pensions (compared to 61% in experiment 2), and 84% wanted to do something about their pension (compared to 83% in experiment 2). However, as in experiment 2, the educational condition they were in had no impact on this response. A chi-Squared test of independence found no statistically significant association between the educational message and defensive avoidance with the respective results, χ^2 (3, N = 417) = .65 p =.885 (for the first question), χ^2 (3, N = 417) = 2.89 p = .409 (for second question).

Derogation and manipulation index: The derogation and manipulation index measured the extent to which participants found the message that they had read exaggerated or misleading (α = 0.95). As before, a one-way analysis of variance showed that the effect of the condition on perceptions of the message was significant, $F(2,307)$ = 55.75, $p < .001$. Again, as with the experiment 2 with the younger demographic, the condition which elicited the most negative reaction (in the sense that the respondents perceived it as more overblown/ exaggerated/ overstated etc.) was the one designed to

trigger positive affect and the group that received the emotionally neutral message showed the lowest resistance.

Table 8-3 *Means and standard deviations of derogation and manipulation index as a function of educational nudge*

	Derogation and manipulation index		
Condition	n	*M*	*SD (se)*
Fear	99	17.84	7.75 (.78)
Positive affect	106	25.11	7.96 (.77)
Emotionally neutral	105	14.74	6.14 (.60)

Note: Derogation and manipulation index scored from 6 – 42 where higher scores represent more agreement that the message read was overblown/ exaggerated etc.

Table 8-4 *One-way analysis of variance of derogation and manipulation index by educational nudge*

Source	df	SS	MS	*F*	*p*
Between groups	3	5974.03	2987.02	55.75	.000
Within groups	413	16450.11	53.58		
Total	416	22424.14			

In sum, there was mixed support for the fourth hypothesis as it related to fear control responses. As in experiment 2 there was a (perhaps surprisingly) high level of willingness to think about the issue, however there was no association between the message read and defensive avoidance. There was however a strong impact of the positive affect message on the derogation and manipulation index.

- The educational nudge that participants read had no statistically significant impact on defensive avoidance.
- The educational nudge that participants read had a statistically significant impact on the derogation and manipulation index, with the positive affect message the one that was more likely to be regarded as exaggerated.

(III) Subjective Value Placed on Occupational Pension

This asked participants to rate how attractive they found various job packages where there was a trade-off between higher pay or a better pension. Again, participants were presented with three sets of comparisons to make. In the first set they were asked to compare and

rate the attractiveness of two different jobs, one with a generous DB pension (but lower pay) and one with a minimal DC pension (but higher pay). The question asked them to compare and say how attractive they found three different jobs all with a DC pension and again where there was a trade-off between pay and pension. The third question asked them to make a choice (out of seven) of one job in which there was an incentive to defer, in that the more pay was taken in the form of a pension, the higher the total value of the total package.

Comparing DB to DC pensions: The mean attractiveness of the job with the low pay but generous DB pension (M = 67.74, SD = 19.73) was little different to that of the job with the higher pay but less generous pension (M = 69.31, SD = 19.46). A paired samples t-test showed that this difference was not statistically significant, $t(416) = 1.14$, $p = .256$. This was in contrast to experiment 2 where participants placed a higher subjective value on the job package with the better pay but worse pension.

Table 8-5 *Means and standard deviations on the measure of attractiveness of job package as a function of pay v pension trade off*

		Attractiveness of job package score	
Job package	n	*M*	*SD (se)*
Job low pay/ DB pension	417	67.74	19.73 (.97)
Job high pay/ DC pension	417	69.31	19.46 (.95)

As before, to see if the message which participants read had any impact on this difference, a new variable was created which calculated the difference between the ratings that each individual gave to the two jobs[107]. A positive number implies that an individual subjectively values a job package more highly if it offers better pay and a lower (DC) pension. As with experiment 2, the educational nudge participants read had no statistically significant impact on the difference in perceived value of the two different reward packages $F(3,413) = 1.12$, $p = .340$ (see table 8.6 below).

[107] As before this difference was measured as follows: it was the difference between Q21 and Q20 (Q21-Q20) (called difference Q21-Q20). This in effect describes the individual discount in perceived desirability of a job package when you are paid in the form of a defined benefit pension. For example, if a participant valued the package with the higher pay but worse pension (Q21) at 70/100 and the lower pay but better pension (Q20) at 60/100 then the difference would be 10. In other words, a positive number implies that an individual subjectively values a job package more highly if it offers better pay and a lower (DC) pension.

Table 8-6 *Means and standard errors of (i) difference in perceived value of reward packages comparing DB and DC, (ii) difference in perceived value comparing DC only, and (iii) job choice with incentive to defer, all as a function of educational nudge.*

condition	n	Difference DB v DC *M(se)*	Difference DC *M(se)*	Job choice *M(se)*
Fear	99	-2.65 (2.85)	13.06 (2.21)	2.47 (.17)
Positive affect	106	4.35 (2.66)	10.78 (2.15)	2.42 (.15)
Emotionally neutral	105	2.46 (2.57)	10.37 (2.44)	2.82 (.17)
Control	107	1.85 (2.95)	12.27 (2.21)	2.79 (.18)
total		$F(3,413) = 1.12$, $p = .340$	$F(3,413) = .31$, $p = .821$	$F(3,413) = 1.58$, $p = .193$

Note: Difference DB v DC is the difference in rating that participants gave to the two different reward packages. A positive number implies that the participant preferred the job with the higher pay but worse (DC) pension.
Note: Difference DC is the difference in rating that participants gave to the job with the lowest and highest DC pensions, a higher positive score implies that respondents prefer a job with lower pay but a better pension.
Note: Job choice with incentive to defer is scored 1 – 7, where 1 = job package with most pay deferred and 7 = job package with least pay deferred.

Comparing different DC pensions where there is a trade-off between better pay now or a better pension later: Here participants were asked to say how attractive they found three different jobs, all with DC pensions, but offering a trade-off between a better pension or lower pay. Again, the total cost to the employer of all the packages was broadly the same. Without splitting the data by condition, the reward packages that offered a better pension (but correspondingly lower pay) were perceived as being more attractive. As with the earlier study, there was very little difference in mean attractiveness of the two job packages with the better pensions (i.e. the ones offering either 10% or 20% pension). One implication of this result might be that while 3% is associated with being a poor pension, anything over 10% just counts as 'good'.

Table 8-7 *Means and standard deviations of perceived attractiveness of the three reward packages where there was a trade-off between pay and a pension.*

	Attractiveness	
Reward package	*M*	*SD (se)*
£45,000 plus pension of 3%	60.77	19.86 (.97)
£42,000 plus pension of 10%	72.11	17.41 (.85)
£38,500 plus pension of 20%	72.63	21.84 (1.1)

Note: Attractiveness is scored 0 – 100

When comparing the reward package with the lowest pay and best pension (Q24) with the job package with the highest pay and lowest pension (Q22) a paired samples t-test showed that there was a statistically significant difference, $t(417) = 8.21$, $p < .001$ (see appendix D.3)

As before, a new variable was created (called 'Difference DC pension'). First the average of the two packages with the 10% and 20% pension was taken. Next the score for the job with the 3% pension was subtracted from this average. The resulting variable gives you an indication of the extent to which participants preferred the jobs with the higher pension but slightly lower pay. A positive score implies that respondents prefer a job with lower pay but a better pension. The educational nudge that participants read, however, had no statistically significant impact on the relative value they placed on the different reward packages: $F(3,413) = .31$, $p = .821$ (see table 8.6 above).

Comparing job choice where there was an incentive to defer: In this case rather than rating the different packages, participants were asked to choose which one they would go for. Here there was an incentive to defer for employees and so the cost to the employer was higher as the pension got better. A higher score represents a choice for higher pay, but a lower pension. In general respondents seemed to express a preference for a relatively high pension, even when it meant a slight (but less than proportional) decrease in current salary. The average score was 2.63 (which represents a choice for a pension of between 20% and 25%). These results are very similar to those in experiment 2 with the younger age group (where the average score was 2.82). However, as with the earlier study, an analysis of variance showed that the message that participants read had no statistically significant impact on the choice made: $F(3,413) = 1.58$, $p = .193$ (see table 8.6).

In sum while the millennials in experiment 2 (in chapter 7) undervalue a defined benefit pension, this was not the case with the older age group who placed a much more

'economically rational' valuation on the two reward packages. However, the educational nudge that participants read had no impact on the relative evaluation of the two reward packages in either study.

When it came to comparing between DC pensions of varying generosity, as before, participants on average rated the jobs with the better pension but slightly worse pay more highly. In both studies there was very little difference between the valuations placed on a job with a pension of 10% or a pension of 20%. Again, in both studies there was no impact of the educational nudge on this relative evaluation.

Where there was an incentive to defer, there was a general preference for higher pension and lower pay. Again, the educational nudge had no impact on the job package chosen. In relation to the fourth hypothesis:

- When participants were comparing DB and DC pensions the educational nudge had no impact on the subjective value placed on a reward package.
- When participants were comparing different levels of DC pension the educational nudge had no impact on the subjective value placed on a reward package.
- When there was an incentive to defer the educational nudge had no impact on the choice of reward package.

8.4.4 Mediation

The fifth hypothesis was that expectancy (how easy you find it to perform the desired behaviour), instrumentality (beliefs about the effectiveness of the recommended response), and valence (the extent to which a person values a given outcome and reward), mediate the relationship between the educational nudge and pension engagement. As in experiment 2, the 'attitudes to pensions' index (a continuous variable scored from 3 to 21 where higher scores indicate more positive attitudes towards pensions as a way to save for retirement) was chosen as a measure of pensions engagement[108]. Again PROCESS (Hayes, 2018) was used to estimate the model of mediation. The statistical model was the same as in chapter 7.

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[108] In the first study 'attitudes to pensions' was chosen as the variable of interest in part as it was the only one of the three to have a statistically significant association with the experimental condition. In experiment 3 hypothetical behaviour also had a statistically significant association with the experimental condition, so future research could look at whether expectancy instrumentality and valence mediate this relationship.

Mediation Expectancy

Expectancy is the belief that individuals have in their ability to perform a particular behaviour; in this case to save money in a pension. It was measured with three items combined into a scale (EXPSCALE) (Cronbach's alpha = .788). The question being asked here, was to what extent the impact of the educational nudge on attitudes towards pensions, was explained by its effect on people's attitudes towards their ability to save.

- X variable used was CONDNUM[109] (dummy coded so the reference category is the control group, D_1 is the fear message, D_2 is the positive affect message and D_3 is the emotionally neutral message. Indicator coding was used.)
- Y variable used ATTPENS (measured from 3 to 21 where higher scores represent more positive attitudes to occupational pensions as a way to save for retirement).
- Mediator used 'EXPSCALE (measured from 3 – 21, where higher scores represent more belief in one's ability to save).

There was (as reported above in the main results) a statistically significant main effect of the experimental condition on attitudes to pensions (those participants who read the emotionally neutral message had higher scores on attitudes to pensions, $R^2 = .03$, $F(3,413) = 4.25$, $p = .0056$). However, there was no evidence of this relationship being mediated by expectancy (see appendix D.4 for the full output). There was no statistically significant effect of the experimental condition on expectancy, $R^2 = .0015$, $F(3,413) = .21$, $p = .8873$[110] (pathway 'a' in the statistical model for mediation). And while the coefficient for pathway 'b' (the effect of the mediator expectancy on attitudes to pensions) was statistically significant (the coefficient for the expectancy index, EXPSCALE = .2094, $se = .0379$ $t = 5.53$, $p < .001$), the relative indirect effect was not statistically significant. As in the previous analysis in the PROCESS model the test for interaction comes from an estimate and test of the indirect effect of X (experimental condition) on Y (attitudes to pensions) through M (expectancy). The relative indirect effect is the product of the two coefficients 'a' and 'b', and the test for this is done through confidence intervals. As the confidence

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[109] The process macro automatically creates dummy variables where 1 is automatically selected to be the reference category. So that the reference category in this section was the control group, a new variable was created for the process analysis, called CONDNUM, where 1 = the control, 2 = fear, 3 = hope/positive affect, 4 = information. This meant that when the process tool created dummy variables the reference category was the control group. Fear became D_1 (or X1). Hope became D_2 (or X2) and information became D_3 (or X3).

[110] See outcome variable expscale in process output in appendix D.4

intervals (see table 8.8 below) all contain zero, there is no evidence of expectancy as a mediator for any of the experimental conditions.

Table 8-8 *Bootstrap confidence intervals for the relative indirect effects of experimental condition on attitudes to pensions with expectancy as a mediator*

	Relative indirect effects of experimental condition on attitudes to pensions			
	effect	BootSE	BootLLCI	BootULCI
D_1 (fear)	-.0927	.1411	-.3814	.1824
D_2 (positive affect)	-.0837	.1342	-.3683	.1648
D_3 (emotionally neutral)	-.0373	.1284	-.2894	.2200

Note: The indirect effect is calculated as the product of a_jb. As the sampling distribution of two regression coefficients is not normal, inference is done through confidence intervals.

Mediation Instrumentality

The same process was carried out with instrumentality as a mediator. Instrumentality is related to issues such as trust in the system and understanding of the correlation between performance and outcomes. It was measured with 5 items that were combined into a scale (INSTSCLE). The question being asked here was whether instrumentality mediates the relationship between the experimental condition and attitudes to pensions.

- X variable used was CONDNUM (the reference category is the control group, D_1 is the fear message, D_2 is the positive affect message and D_3 is the emotionally neutral message. Indicator coding was used.)
- Y variable used ATTPENS (measured from 3 to 21 where higher scores represent more positive attitudes to occupational pensions as a way to save for retirement).
- Mediator used 'INSTSCLE' (measured from 5 – 35, where higher scores represent more belief and trust in the pension system).

Again, there was no evidence to support the hypothesis that instrumentality mediated the relationship between the experimental condition and attitudes to pensions (see appendix D.4). There was no statistically significant effect of the experimental condition on instrumentality, R^2=.0097, $F(3,413) = 1.35$, $p = .2585$ (pathway 'a' in the statistical model for mediation). Pathway 'b', which estimates the relationship of instrumentality on attitudes to pensions (it quantifies how much those who differ by one unit on instrumentality (M), but read the same educational nudge (X), are estimated to differ on Y

was significant (the coefficient = .4280, *se* = .0342, *t* = 12.53 *p* <.001). However, as the confidence intervals in table 8.9 below show, the relative indirect effect of experimental condition (the product of 'a' and 'b') on attitudes to pensions via the mediator instrumentality was not significant.

Table 8-9 *Bootstrap confidence intervals for the relative indirect effects of experimental condition on attitudes to pensions with instrumentality as a mediator*

	Relative indirect effects of experimental condition on attitudes to pensions			
	effect	BootSE	BootLLCI	BootULCI
D_1 (fear)	-.3913	.2542	-.8725	.1143
D_2 (positive affect)	-.2950	.2725	-.8251	.2386
D_3 (emotionally neutral)	.0525	.2517	-.4288	.5589

Note: The indirect effect is calculated as the product of $a_j b$. As the sampling distribution of two regression coefficients is not normal, inference is done through confidence intervals.

Mediation Valence

Finally, the same process was carried out with valence as a mediator. Valence is the extent to which a person values a given outcome or reward and was measured by asking to what extent people want to smooth their income over their lifetime[111].

- X variable used was CONDNUM (the reference category is the control group, D_1 is the fear message, D_2 is the positive affect message and D_3 is the emotionally neutral message. Indicator coding was used.)
- Y variable used ATTPENS (measured from 3 to 21 where higher scores represent more positive attitudes to occupational pensions as a way to save for retirement).
- Mediator used 'VALNCE' (measured from 1 - 6 where higher scores represent a desire for an income profile that increases with retirement)

Again, there was no evidence to support the hypothesis that valence mediated the relationship between the experimental condition and attitudes to pensions (see appendix D.4). There was no statistically significant effect of the experimental condition on valence, (R^2= .0089, F(3,413) =1.23 , p = .2982) (pathway 'a' in the statistical model for

[111] It was scored from 1 – 6, where higher scores reflect a desire for an income profile that increases with retirement. A score of 4 = option D which represents a desire for a flat income profile over your lifetime.

mediation). Pathway 'b', which estimates the relationship of valence on attitudes to pensions was also not significant (the coefficient = -.0145, *se* = .1428, *t* = -.1164 *p* =.9074). As the confidence intervals below also show, the relative indirect effect of experimental condition (the product of 'a' and 'b') on attitudes to pensions via the mediator valence was not significant.

Table 8-10 *Bootstrap confidence intervals for the relative indirect effects of experimental condition on attitudes to pensions with valence as a mediator*

	Relative indirect effects of experimental condition on attitudes to pensions			
	effect	BootSE	BootLLCI	BootULCI
D_1 (fear)	-.0042	.0439	-.1084	.0783
D_2 (positive affect)	-.0049	.0473	-.1059	.096
D_3 (emotionally neutral)	-.0016	.0285	-.0646	.060

Note: The indirect effect is calculated as the product of $a_j b$. As the sampling distribution of two regression coefficients is not normal, inference is done through confidence intervals.

To summarise the effect of mediation: The fifth hypothesis was that the impact of the three educational nudges on pension engagement would be mediated by expectancy, instrumentality and valence. Pension engagement was measured using the index of attitudes to pensions. While in experiment 2 expectancy and instrumentality were found to mediate the relationship between the educational nudge and attitudes to pensions, this was not the case in this study with older participants.

- No support was found for the proposition that expectancy mediated the relationship between the educational nudge and attitudes to pensions.
- No support was found for the proposition that instrumentality mediated the relationship between the educational nudge and attitudes to pensions.
- No support was found for the proposition that valence mediates the relationship between the educational nudge and attitudes to pensions

8.4.5 Moderation

Finally, this section turns to consider fear as a moderator of the impact of the educational nudge on attitudes to pensions. As before, the hypothesis being tested is that those individuals who are more worried about how they will manage financially in retirement,

will respond more strongly to the educational nudges, and consequently have a more positive attitude to pensions.

Again, the dependent variable (Y) considered here is the 'attitudes to pensions' index (ATTPENS). The independent variable is the educational nudge that participants were randomised to read, and the moderator (M) is fear (as reported through the fear index). Following Hayes & Montoya (2017) indicator or dummy coding was used to create three groups for the four different educational nudges that participants were randomised to read (fear, positive affect, emotionally neutral and control). The reference group was the control group. D_1 = fear, D_2 = positive affect, D_3 = emotionally neutral, with the control group as the reference category.

A constrained model of no interaction is

$$Y = B_0 + B_1D_1 + B_2D_2 + B_3D_3 + B_4M \quad (8.1)$$

Allowing for interaction (i.e. allowing the differences in means represented by the dummy coding system) to vary linearly with M the model is

$$Y = B_0 + B_1D_1 + B_2D_2 + B_3D_3 + B_4M + B_5D_1M + B_6D_2M + B_7D_3M \quad (8.2)$$

Without considering the impact of fear as a mediator a one-way analysis of variance, as reported earlier, revealed a significant effect of the educational nudge on attitudes to pensions, $F(3, 413) = 4.26$ $p = 0.006$. Those in the emotionally neutral group were more positive about pensions than all the other groups ($M = 17.97$, $SD = 2.87$).

A test of moderation can be undertaken through a model comparison approach. This is done by comparing the fit of the model in equation (8.1) and (8.2) by computing the difference between their squared multiple correlations. (Hayes and Montoya 2017, Field A. 2015). The results showed that, as should be expected, the regression coefficient for the dummy variable for the emotionally neutral group (D_3) was statistically significant, $b = 1.4702$, 95% CI [.5048, 2.4355], $t = 2.9937$, $p = .0029$.

However, while the overall model was statistically significant ($R^2 = .0438$, $F(7,409) = 4.01$, $p = .0003$) moderation was not found. Moderation is shown up by a significant interaction effect, and in this case, the interaction terms for all three groups (fear, positive affect and information) was non-significant.

Fear fearindex: b* = -.1214, 95% CI [-0.5232, 0.2803], *t* = -.5941, *p* = .5528

*Positive affect*fearindex*: *b* = -.0067, 95% CI [-0.4167, 0.4034], *t* = -.0320, *p* = .9745

*Information*fearindex*: *b* = -.3086, 95% CI [-.6819, 0.0647], *t* = -1.6253, *p* = .1049

Further the R –square increase due to interaction of .0107 was not significant, $F(3,409) = 2.06$, $p = .1043$. The full results are in appendix D.5.

8.5 Discussion

This chapter (experiment 3) considered the impact of three alternative, relatively brief, educational messages on pension engagement with an older pool of participants. It might be expected that this age group would respond more strongly to messages about pension saving.

Pension engagement was measured in three ways: danger control responses, fear control responses, and subjective value placed on an occupational pension. With regard to danger control responses, the emotionally neutral message had a statistically significant (if weak) positive impact on attitudes towards pensions. There was no impact of any of the messages on intentions. There was a statistically significant (but weak) impact of the fear message on hypothetical behaviour, with those who read the fear message stating that they would save more than those in the other conditions. With respect to fear control (i.e. avoidance of the message) few people said that their first instinct was to avoid thinking about pensions, and overwhelmingly it was the positive affect message which elicited a more negative reaction. With regard to the value placed on different occupational pensions the message read had no impact on the relative evaluations people made.

How does this compare with the results of the experiment 2 (with the younger pool of participants)? Regarding danger control responses: in both studies, it was the emotionally neutral message that had an impact on positive attitudes to pensions. In both studies, none of the messages had any impact on intentions. In experiment 3, in contrast to experiment 2, there was a statistically significant (but weak) impact of the fear message on hypothetical behaviour, with those who read the fear message stating that they would save more than those in the other conditions.

Regarding fear control responses, the results were broadly the same in both studies. While few people said that their first instinct was to avoid thinking about pensions, the

message read had no impact on this. In both studies, the positive affect message was more rejected, the emotionally neutral message least rejected.

With regard to the value placed on an occupational pension, this older group were arguably much more 'rational' when it came to valuing a defined benefit pension, but otherwise the results were very similar to the earlier study. When the pension was defined contribution, generally participants preferred a job package that favoured a better pension at the cost of lower pay. However, the message read had no impact on the relative evaluations people made.

The mediation hypothesis was upheld in experiment 2, but in this experiment, there was no evidence found of mediation. The impact of fear as a moderator was non-significant in both experiment 2 and 3.

More generally though, despite pervasive ignorance, most respondents were positive about pensions as a way to save for retirement and at least when asked hypothetically, tended to choose relatively high levels of saving.

8.6 General Discussion & Conclusion

Experiment 2 and 3 sought to address two gaps in the research. First, most research on retirement saving, understandably, looks at how to encourage people to save more for their retirement. These experiments sought to place some attention on the importance of job choice when it comes to retirement income. Second it sought to consider the role of affect on pension choices, which Loewenstein et al. (2009) argue, has been somewhat neglected.

On the evidence of the results of these two studies it would be hard to write a compelling story about the impact of educational nudges. The two messages that were designed to appeal to the heart rather than the head, produced no convincing impact on pension engagement different to that of the emotionally neutral message. There were few consistent positive effects, and those that were found, were small. Statistical significance is not the same thing as substantive significance, and arguably the latter is more important in social science research (Hymans, 2018).

Those who argue for negative liberty are often proponents of education. John Stuart Mill (Wolff, 2006) argued that while individuals should be allowed to make mistakes (on the grounds that they would still be more likely to be right about what would in the end make them happy), that society nevertheless had a duty to educate people and try to persuade them what would be the right cause of action. From this perspective if we think that people are not saving enough for their retirement, we should not force them to

save, rather we should reason with them. However the results of these two studies, in the context of wider evidence about the lack of impact of financial education (Fernandes et al., 2014), should suggest caution in the assumption that education is an easy way to improve pension decision-making. The subtext of calls for financial education is that market solutions for pension are workable as long as individuals can be educated. If this is not the case, if even when provided with the relevant information people are unable to make rational choices, then the case for intervention (and the restriction of choice) is stronger.

8.7 Limitations

Experiments can be a very effective way of testing research questions that would be hard, if not impossible, to do in real life (Levitt & List, 2009). However, they are not without their limitations. Most commonly these are divided into problems to do with threats to internal validity and threats to external validity (Leik, 1997). In terms of threats to internal validity, there are at least four areas of concern: (i) subject reactivity; (ii) bias; (iii) failure of the manipulation; and (iv) the unwanted intrusion of external factors. The Hawthorne effect famously shows that our responses can be very influenced by the mere fact that one knows one is being observed. Thus, participant's expectations about an experiment can artificially influence results. This aspect of bias is potentially less of a problem in an online experiment, which removes contact between the experimenter and the participant. However, the measurement process itself (in particular when subjects are exposed to successive assessments) can also interfere with the results. Finally, factors that have not been controlled for in the experiment might confound any apparent relationship.

The most common critique of experiments, however, is in terms of external validity; that they are so removed from real life that their results fail to give any insight into 'real' behaviour. Again, Leik considers four main issues: (i) invalid manipulation; (ii) invalid measurement; (iii) controlling out reality; and, (iv) artificiality of the setting. To expand a touch, is the manipulation in question really manipulating what it is that you think you are manipulating and are you measuring what you intend to measure? Has the context in which participants are making choices removed crucial details which render the results meaningless? Is the artificiality of the situation (often experiments are conducted in a laboratory) influencing the results?

In light of the discussion above, one should then point out the following issues or limitations to the results of the experiments described in chapters 6 – 8. With all three of the studies the most obvious limitation is that of reactivity. People's perhaps genuine

responses to hypothetical choices, may not reflect their real behaviour. It is much easier to choose an apple over chocolate cake when you are doing so only hypothetically. As Choi et al. (2002) point out in their study linking the impact of financial education seminars on actual savings behaviour, while many attendees say they plan to make savings changes, in reality very few actually do.

With respect to the two experiments described in chapters 7 and 8, a further issue might be to do with the manipulation. The three different educational nudges were clearly received differently, so the manipulation did not 'fail' to the extent that it had no observable impact at all. The results from the positive affect message were paradoxical: in the first study, the positive affect message was associated with higher levels of self-reported positive affect; however, at the same time it was also the message that was more rejected (when measured using the derogation and manipulation index). The positive affect message was based on a US financial independence blog, and preached a strongly anti-consumerist message. Future research could perhaps test a message designed to be both encouraging, but in a manner that is perhaps more palatable for a UK based audience.

Arguably some of these limitations would be much more of an issue, had the results generated shown a positive and strong effect of educational nudges. The danger of false positives (a type one error) imply that one should exercise a measure of caution before one concludes that the same positive results would be shown once transposed into a real-world situation, with real money, and real-world distractions and complications.

To sum up, it is common to argue that experiments typically achieve high internal validity at the expense of weak external validity. However, as Leik notes, one should not dismiss experiments solely because of concerns to do with their abstraction. The real world is so complex and messy that it is very hard to observe what causes what, and a well-designed experiment can be a vital tool to suggest patterns of causality.

9 Conclusion: A Shove Not a Nudge

> *"Freedom for the wolves has often meant death for the sheep" (Berlin, 1969 p.xiv)*

This thesis asked to what extent we should be free to choose when it comes to our pension? In other words what is the appropriate balance between state compulsion and individual freedom? The history of the UK pension system in the post war period has been one based on fostering voluntary savings. In Beveridge's words: "The state in organising security should not stifle incentive, opportunity, responsibility; in establishing a national minimum, it should leave room and encouragement for voluntary action by each individual to provide more than that minimum for himself and his family" (Beveridge, 1942 p.7). Consequently, in comparison with much of continental Europe, both the individual and the employer have been left considerable freedom about the choices they make. Has this freedom led to desirable outcomes?

To answer the question, three perspectives were considered. That of the state, that of the employer and that of the individual. The state defines the rules that govern our choices; the employer has a major role in paying for and delivering occupational pensions; the individual bears the responsibility of making good choices for their future self.

9.1 Research Findings

Chapter 4 examined the issue from an institutional perspective. It demonstrated that it is more expensive than it might first appear to design a system that supports free choice. Since the turn of the century, the UK pension system has undergone considerable change. At some cost it has introduced a flat-rate state pension designed to limit means testing, and currently has one of the most generous systems of tax breaks for pension saving in the OECD. In a return to Beveridge's original vision, the state restricts itself to poverty relief, and occupational pension saving is expected to bridge the gap between needs and aspirations in retirement.

Chapter 5 took the perspective of the employer. It found that profit-seeking employers saw little commercial advantage to paying in the form of a pension. Very few saw any supply side reasons to providing occupational pensions, and employees were widely felt to undervalue pensions. Consequently, small firms, or firms operating in labour

markets where employees are low skilled and low paid, saw no commercial reason to do any more than the legal minimum. The largest firms who had more skilled labour, saw mixed demand for a pension, and consequently had adopted highly flexible pension designs so that they could target pension spending at those who most valued it. This implies that, in the private sector, it is only those who work for the largest firms, and are more skilled, that will be likely to accumulate enough savings for a comfortable retirement.

Chapters 6 – 8 took the individual perspective. Chapter 6 looked at the impact that an occupational pension has on perceptions of how desirable a job is. It found that the level of the pension on offer, as well as its framing, was essentially irrelevant to how attractive people found the job (confirming the views given by many of the employers in chapter 5). Chapter 7 then turned to see if those preferences could be influenced by financial education, using a sample of younger adults. If the UK government has restricted its role to providing poverty relief in retirement, and if few employers see any commercial incentive to providing occupational pensions above the legal minimum, can education help the young make the right choices? The answer was no. Chapter 8 repeated the experiment in chapter 7 with an older group of participants. It asked whether financial education would fall on more fertile ground with those who were closer to retirement, and thus might be assumed to be more concerned to engage with thinking about it. The results were very similar to those in chapter 7.

9.2 Contribution to Knowledge

This thesis sought to present three new perspectives on the pensions debate. First, it presented a model of pension design that highlights the importance of coherence. It argued that a pension system is coherent when the presence or particular form of one part of the system reinforces the functioning or efficiency of another part. This logic implies a fundamental choice for the state. If occupational pension saving is compulsory, then the state does not need to provide strong incentives to save. In contrast, if occupational pension saving is voluntary, then the state needs to design a system which incentivises saving, and pay careful attention to how different elements of the pension system reinforce or undermine each other.

Second, it recast the issue of whether people are saving 'enough' for their retirement by looking at the job choice itself. Previous research on pension decision-making has focused on the pension choice in isolation: if left to their own devices do people fall prey to the common behavioural biases and save less for their retirement than

their future selves would like? However, your job choice (whether you choose a job with a 'good' pension or not) will potentially have a much larger impact on your later financial health than the isolated decision to save a few percent more or less. This has wider implications than the costs to the individual alone. As Akerlof (1970) showed, in a market with information problems, if buyers are unable to distinguish the quality of goods, the market for this product will degrade. By extension, if employees are unable to value a pension, then 'bad' pensions will crowd out the 'good'.

The third contribution was to look at the role of affect in decision-making. As Loewenstein and Lerner (2009) argue, much research on financial decision-making has concentrated entirely on our cognitive biases and neglected the role of affect at the moment of the decision. While emotions are often viewed as a negative corrupting influence they can also have a more positive effect – namely to provide the motivation necessary to pursue the chosen course of action.

9.3 Should We Be Free to Choose When it Comes to Our Pension?

A careful reader might notice that the question that this thesis addressed has yet to be answered. Ultimately, the answer to the appropriate boundary between state compulsion and individual freedom is normative, and will be informed by the extent to which you believe the state has the right to intervene in our choices. For Nozick, there can be no justification, and certainly not one that appeals to paternalistic appeals to save people from themselves. Freedom of choice is an absolute value, and (almost) any state interference in our pension saving is akin to theft. For Rawls, social justice is the primary good, and the state should intervene heavily, and should redistribute up to the point at which increasing equality will harm those who are least well off in society (the Difference Principle).

Berlin's distinction between negative and positive liberty offers another way to think about the question. Negative liberty is the absence of constraints, or the freedom from being prevented by others from doing what one wants (i.e. Nozick's understanding of liberty). Positive liberty, in contrast, is the active ability to take control of one's life and realise one's fundamental purpose (i.e. closer to Rawl's conception of liberty). Berlin argues that while positive and negative liberty are both desirable goals, they are also different goals, and may clash. Where there are conflicting objectives, he argues there can be no calculable solution. Consequently, where one draws the line between these goals is a matter for haggling.

We are left then, in Berlin's words, to haggle, and if this question can never be fully settled, it can be informed by a discussion of the costs and benefits of alternative policies. To conclude, at the end of this PhD I find that I think very differently about pension freedom compared to the start. I began from a position of enthusiasm about the benefits of free choice. I still think that being free to choose is enormously valuable. And yet it is unavoidable that when it comes to pensions: (i) it is expensive to design a system that will incentivise voluntary saving; (ii) profit-seeking employers see little commercial advantage to paying in the form of a pension; and (iii) even if you do design a system in which it is rational to save, most individuals will still not respond to these incentives as they should because of almost insurmountable information problems. The current UK pension system is founded on an ideological commitment to free choice and individual responsibility, and this carries an unduly heavy cost, not only for the individual, but also for the state.

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11 Appendices

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D.1 Survey

D.2 Details of calculation for salary for job packages

D.3 Paired samples t-test comparing different DB pensions

D.4 Process output: Expectancy, instrumentality and valence as a mediator

D.5 Process output for fear as a moderator

Appendix E: Glossary

Appendix A Appendices for chapter 5

Appendix A.1 Summary demographics and pension details

Company and title of person interviewed	Pension details	Company description & summary of logic behind pension plan
Consultancy Firm Interviewee: Partner, Actuarial and Pension Services	Due to growth by acquisition they had a large number of different pension schemes. Around 2012 (prompted by auto enrolment) they closed all the DB schemes (both to new entrants and to future accrual), and harmonised into one DC scheme: A DC matching scheme: Each 1% employee contribution is matched by 1 ½% from employer up to a cap of 12% from the employer (for a total of 20%). (Employees are auto enrolled on the lower end, and average cost to firm is about 10%). Contributions made on basic salary, and done on a salary sacrifice basis with savings being returned to the employee. Auto enrolled at lower end, average cost to firm around 10%. Done using salary sacrifice so the employees NI is passed back to them and the employees NI is invested into the pension.	<u>Company description</u> FTSE 100 professional services and accounting firm with 263,900 employees (14,500 in the UK eligible for this scheme). <u>Logic of pension:</u> When auto enrolment was introduced they wanted to harmonise their different pension offers into one scheme that suited their large range of employees. "We wanted one size fits all (for consistency), we wanted member choice, we wanted it to be distinctive in the market, and we defined that to be a scheme that would be in the top 10% of schemes in the UK by benchmarking."
Fashion Agency Interviewee: CEO	DC Auto enrolment minimums (Apart from a few cases where employees have been tuped over and their better rates were kept).	<u>Company description</u> A young, fast growing, entrepreneurial Fashion agency that operates both retail and distribution for leading fashion brands. 600 employees (300 in UK). <u>Logic of pension:</u> Auto enrolment minimums, so to spend as little as possible on a benefit that they did not feel was valued by employees.
Fashion PR	DC. Currently auto enrolment minimums.	<u>Company description</u>

Interviewee: CEO	However, for the 10 years before auto enrolment they matched 2% of contributions (this had a very low take up – about 15%). Currently paying 2% contributions, moving into auto enrolment as it stages. Senior team get 4%.	28 employees. <u>Logic of pension:</u> Now at Auto enrolment minimums, in the earlier days they wanted to ape their competitors and so offer a (very small) pension. At the same time they did not want to spend much on a benefit that they did not feel was valued by employees.
Architects Interviewee: Director	DC. New staff are auto enrolled at 1% from employee and 1% from employer. After six months it increases to 8% (3% from employee and 5% from employer). Prior to auto enrolment all staff who wished to join were offered 3% ee and 5% er match. Pre auto enrolment about 1/3 of staff joined the pension.	<u>Company description</u> Small award winning Architectural practice founded in 1996 with 26 employees. <u>Logic of pension:</u> Wanted to offer a tax efficient benefit, and copied the pension offer of another famous (enlightened) architectural practice.
Major Defence Contractor Interviewee: Head of Performance & Reward	They had just closed their DB scheme (to both new entrants and future accrual) and replaced it with the following: Defined contribution with the following contribution structure: 3% ee plus 9% employer match 4% ee plus 10% employer match 5% ee plus 10.5% employer match 6% ee plus 11.5% employer match (new employees defaulted in at this match) 7% ee plus 12% employer match 8% or more 13% employer match Charges very low (less than 0.3%) All employees defaulted into a 'lifestyle' fund at a 6% contribution level. About half workforce are contributing t 8:13 (previously when they were in a DB fund employees were contributing at 10%)	<u>Company description</u> Major defence contractor that had been moved from public to private ownership. Highly skilled workforce. 5000 employees. <u>Logic of pension:</u> They needed a generous enough scheme to get it past the two unions. Its design was driven by the philosophy of giving flexibility in choice so that the pension reflects employee demand given their own personal circumstances.

Large Clothing Retailer Interviewee: HR Director.	They offer different contributions for store and head office staff. Store employees are auto enrolment minimums Junior head office employees and store managers are on a 2:2 match (up to head of department) Head of department are on 4:4 Directors are on 0:6 (ee/er) All staff that are on the 1:1 match have their contributions based on qualifying earnings. If employees want to make higher contributions they get the NI savings on the extra contributions they make (but not on the matched element). Higher earners have their contributions based on total earnings, capped at 45K	<u>Company description</u> 1,100 employees (900 store employees of which about 30% part time). 90% female. <u>Logic of pension:</u> Auto enrolment minimums, so to spend as little as possible on a benefit that they did not feel was valued by employees.
Large Restaurant Group Interviewee: Head of People	DC Staff auto enrolled into NEST on minimums. More senior staff (generally on salaries of over £50K) are given an employer match of 3% He did not know the opt out rate for junior staff but guessed at 10%	<u>Company description</u> 2,300 staff. Average age is about 27 and about 40% part-time. High level of staff turnover. <u>Logic of pension:</u> Auto enrolment minimums, so to spend as little as possible on a benefit that they did not feel was valued by employees.
Independent TV Company Interviewee: CEO & HR director	Defined contribution All new employees enrolled on auto enrolment minimums, after a 2 year qualifying period they are entitled to 5:5, or they can opt out. This 2-year period designed so that they don't have to offer pensions to freelancers (above auto enrolment) They also have a range of legacy DC pensions, with different matching schedules. These go up to a 10% employer contributions, in some cases requiring no employee match. Done through salary sacrifice and half the NI saving given back to the employee.	<u>Company description</u> Independent TV and film production company. 480 permanent staff. Well over 1,000 if you include freelancers. <u>Logic of pension:</u> They wanted to be offering something a little bit better than auto enrolment minimums, in part because their peers do (competitive pressures) in part to generate a reputation as a 'nice place to be' (signalling).

Challenger Bank Interviewee: Senior HR manager	DC. No legacy pensions (as a new company) Employer puts in 7.5% if employee puts in 5% (i.e. a 1.5 match). Or employee can go to auto enrolment levels. Contributions paid on full salary. 9% have opted out. 43% choose to contribute at auto enrolment levels. 6% make contributions higher than the 5% required to get the match. The ExCo, and anyone else paid over £150K get a 'pension allowance' of 15%	<u>Company description</u> A 'challenger bank' that was publicly held, but has recently been bought back into private ownership through a private equity structure. 700 employees <u>Logic of pension:</u> A mixture of a patriarchal culture and market expectations. "in terms of the company and its culture it's quite a patriarchal type company. So, one of the other benefits that we have is that we, people, get family private medical insurance. So, it's that sort of culture I would say. But also, if you look at the market place that typically we are recruiting in, the competitors would be giving you know, reasonable pension provision. So, a lot of the people we recruit come out of the big banks, so that's the sort of market place we are recruiting in and so it is what people would expect."
Mortgage Brokers Interviewee: CFO	Defined contribution. Done on a rounded figure, that broadly equates to 8% of qualifying earnings. Of this figure, 4% from employer, 4% from the employee. (So very slightly more generous than auto enrolment which would be 3:5) 90% have remained auto enrolled.	<u>Company description</u> 60 employees <u>Logic of pension:</u>
Data & Communication Business Interviewee: Head of HR	Defined contribution 6% from employer and 2% from employee paid on entire earnings, but on basic salary only (not commission).	<u>Company description</u> Young Data & communication business. High tech, innovative and knowledge intensive firm. They employ young, very educated, and highly paid, overwhelmingly male employees. 90 in the UK

		Logic of pension: As a start-up they could not afford to pay the very highest salaries so a lot of focus was put on the benefits side of the package. A pension was seen as one way of signalling that the employer cares: "we invest in family friends your future...I would think that it speaks of what we care about".
Multi-National Energy Company Interviewee: Head of Benefits	1. A "very generous" final salary DB pension (closed to new entrants but open to future accrual). About 50% of workforce still in this scheme. 2. All new entrants given a flexible benefits amount of 15% of salary which they can use for a DC pension (or other benefits such as healthcare if they prefer). They are defaulted in at 5% and average contribution is just under 10%. Opt out is about 8%. Contributions are from first £ earned, there is no cap. 3. Retail staff: DC pension with 2% employee contribution and 8% employer match after 5-years' service. Pre auto-enrolment, few of that group took it up.	Company description FTSE 100 British multinational oil and gas company. 9000 in main business, 5000 in retail business. Logic of pension: To design a flexible benefits package that allowed employees the freedom to use the money as they wished, and recognised that for some people pension would not be all-important.
Large Manchester Based Retailer Interviewee: Former Head of pensions	1. Defined benefit scheme, closed to new members in 2012, but open to future accrual. It was closed because of auto enrolment. Before closure about 40% of workforce chose to join. Employee contributions of 6%, employer contributions of 9-10%. Final salary with an accrual rate of $1/60^{th}$ moved to $1/80^{th}$. When it was open only 40% of workforce opted to join. 2. After 2012 all new employees auto enrolled to NEST on auto enrolment minimum contribution rates. (Currently 1:1 moving to 2:3 in April 2018).	Company description Large family owned retail chain, established in the 1860s. 1325 outlets in the UK and Ireland 4,700 employees Logic of pension: Auto enrolment minimums, so to spend as little as possible on a benefit (The CEO & CFO) did not feel was valued.

Small Training Firm Interviewee: Founder	Compliant with legal auto enrolment minimums.	Company description Training and recruitment consultants 16 employees plus freelancers Logic of pension: Auto enrolment minimums to spend as little as possible on a benefit the founder did not feel was valued by his millennial employees.
Professional Services Partnership Interviewee: Partner & Head of Partner Affairs	For partners: A notional (unfunded) scheme. Partners 'put' 7% of their profits into a notional fund. This 'fund' has a notional growth rate of RPI applied to it. When they retire (at the later of age 55 or retirement date) they can then choose what period to spread this amount over. If you have 1million for example, you could take 200K for 5 years. The 200K would increase each year it is in payment by RPI. This is not regulated as a pension. Partners are also expected to make their own pension arrangement in addition to this. For employees: Defined contribution with the following contribution structure: 2% ee plus 2 % employer match 3% ee plus 3% employer match 4% ee plus 6 % employer match 5% ee plus 7.5 % employer match 6% ee plus 9 % employer match 7% ee plus 10.5 % employer match 8% ee plus 12% ee plus % employer match Capped at £150,000	Company description FTSE 100 multinational professional services firm. 236,000 employees. In the UK 18,000 staff and 900 partners. Logic of partner pension: To ensure that partners have a long-term commitment to the health of the firm (skin in the game). Logic of employee pension: (not discussed)

Appendix A.2 Interview template

Themes	Comments/ Questions
Introduction to the overall question: In your experience as an employer: Is a 'good' pension an important part of the reward package? A small initial study, which takes the perspective of the employer, which is part of a larger research enquiry. This should take no longer than one hour. Confirm participants are happy for the discussion to be recorded. Confirm anonymity and confidentiality.	
Personal knowledge of your firm's current pension policy	• Please describe your firms current pension policy • Do you pay the pension just on the qualifying earnings band, or on the whole salary? • Do you have different pension contributions for different grades (i.e. more generous for senior staff?) • What is the take up/ opt out at different levels
Here move into a discussion of the reasons why an employer might seek to provide a pension	
Logic behind current pension policy	• What is the reasoning behind the current pension provision?
Is a pension an effective way to recruit/ motive/ retain labour?	• How important do you think the pension offer is to employees • Do you think employees compare their pension benefits to friends/ colleagues? • How do you feel about the balance between salary/ bonuses/ pension and other benefits? • How long do you want to keep employees (i.e. do you want to employ people until retirement age? Or do you prefer a turnover of staff?) • Do you think offering a more generous pension would attract a different type of employee [don't ask directly – too leading]
Perceived value of a pension	• Do you think employees understand tax benefits of pensions? • Do you think employees undervalue a pension (compared with the actuarial cost – i.e. if offered 10% in increased pay or 10% invested into their pension which do you think they would pick?) • Do you feel that there has been any increase in awareness of the need to save for a pension?

Unions	• Do you recognise/ negotiate with unions on pension entitlement?
Labour force management	• Is a pension a way to get people to retire when you want them to?
Future direction?	• Do you envisage any potential changes to your pension offer (i.e. more or less generous)?
Gender/ intergenerational equity issues:	• Do you think there is any difference between men and women in how much they value a pension as part of their reward package? • Do you think there is any perceived inequality from younger workers v older workers?
Financial education	• Do you provide financial education? • What is the take up of financial education? • Do you think financial education 'works'?
Pensions as part of employee engagement	• Do you think you get anything out of paying people in the form of a pension rather than just pay – e.g.: does it increase employee engagement, give a more paternalistic feel to the firm. What message does a more/ less generous pension send?
Responsibility	• Who you think is responsible for making sure that employees have enough to support them in retirement?
Details about company	• What is your title? • How many employees do you have (roughly) • Do you offer salary sacrifice? If you do what do you do with the employer's NI saving?
Snowball Question: Do you know anyone else who I could talk to?	

Appendix A.3 Template for coding

Data analysis template

Themes

1. Economic

A. Supply side reasons

- **Supply side reasons (in general)**

(i) Subcategory: reduced turnover

(ii) Subcategory: increased productivity

- Incentive
- Sorting

(iii) Subcategory: Gift exchange/ signalling

(iv) Subcategory: Timing of retirement

B. Demand side reasons

- **Demand reasons (in general)**

(i) Subcategory: tax

(ii) Subcategory: risk

(iii) Subcategory: transaction costs

2. Behavioural economic

(i) Bounded rationality

(ii) Bounded self-control

3. Choice and flexibility

Appendix B Appendices for chapter 6

Appendix B.1 Details of conditions for job advertisements

Pension condition:

(i) No mention of a pension

(ii) The description of the benefits package included: 'Pension, to which we contribute a further 4% of your salary'

(iii) The description of the benefits package included: 'Pension, to which we contribute a further 10% of your salary'

Regulatory condition:

For the pension condition with no mention of a pension either one of the following was added:

- Promotion framing condition: "We believe that it is important to think about the future. Our benefits package is designed *to help you reach your goals for the future, and to make your retirement everything you dream of."*
- Prevention framing condition: "We believe that it is important to think about the future. Our benefits package is designed *for your financial security, to take the anxiety from your retirement planning."*

For the 4% and 10% pension condition, either one of the following was added:

- Promotion framing condition: "We believe that it is important to think about the future. Included in our benefits package is our excellent pension, *which is designed to help you reach your goals for the future, and to make your retirement everything you dream of.*
- Prevention framing: "We believe that it is important to think about the future. Included in our benefits package is our excellent pension, *which is designed for your financial security, and to take the anxiety from your retirement planning."*

Appendix B.2 Details of income customisation for job advertisement

These 6 basic combinations above were further customized according to 4 different earnings bands (based on answers to Q34).

Income group A: (75.8 % of the sample fell into this group)
Those who answered (1), (2) or (3), i.e. that they earned less than £29,999 saw job advertisements with the following salary bands:

- For no mention of pension and the 4% pension condition: salary range offered was £26,00 - £32,000 (for an approximate maximum total cost to the employer of £33,280)
- For the 10% pension condition: salary range offered was slightly lower at £25,000 - £31,000 (for an approximate maximum total cost to the employer of £34,100)

Income Group B: (12.3 % plus 2.5% of the sample fell into this group)
Respondents who selected (4) (£30,000 – £39,000) or (7) (prefer not to say) saw advertisements with the following salary bands:

- For no mention of pension, and the 4% pension condition: salary range offered was £36,00 - £42,000 (for an approximate maximum total cost to the employer of 43,680)
- For the 10% pension condition: salary range offered was again slightly lower at £34,000 - £40,000 (TV= 44,000)

Income Group C: (6.5 % of the sample fell into this group)
Respondents who selected (5) (£40,000 – £49,999) saw advertisements with the following salary bands:

- For no mention of pension, and the 4% pension condition: salary range offered was £46,00 - £52,000 (for an approximate maximum total cost to the employer of £54,080
- For the 10% pension condition: salary range offered was again slightly lower at £44,000 - £50,000 (for an approximate maximum total cost to the employer of £55,000)

Income group D: (3% of the sample fell into this group)
Respondents who selected (6) (more than £50,000) saw advertisements with the following salary bands:

- For no mention of pension, and the 4% pension condition: salary range offered was £56,00 - £62,000 (for an approximate maximum total cost to the employer of £64,480)
- For the 10% pension condition: salary range offered was again slightly lower at£53,000 - £59,000 (for an approximate maximum total cost to the employer of £64,900)

Appendix B.3 Survey questionnaire

Q2 Introduction.
You are being asked to complete a study about workplace culture. If you agree to take part, you will be shown a job advertisement, answer some questions about it, and answer some questions about yourself. You may stop the study at any time, but you will only be paid (£5) if you finish all of it. Your participation in this study is entirely voluntary. There are no direct benefits to participating. Participation presents minimal to no risks. The information you provide will be completely anonymous, because we do not ask for your name or any information that could identify you personally. However, this data will be available to other researchers. If you have questions about this research study or what you are being asked to do, please ask for an explanation before you agree to participate.
Heather Kappes
Department of Management
London School of Economics and Political Science (LSE)
H.Kappes@lse.ac.uk

- o I have read and understood the above consent form and desire of my own free will to participate in this study. (1)

Q49 Please enter your Prolific ID

Q28 First, please answer a few questions about yourself.

Q33 Which of the following categories best describes your current employment status?
Employed working 35 or more hours per week
Employed working 1 - 34 hours per week
Not employed, looking for work
Not employed, NOT looking for work
Retired
Disabled, not able to work
Other:

Q41 Are you currently a student? (yes/no)

Q114 Are you actively looking for a job? How true is the following statement of you?
I am actively looking for a job (measured on a scale of 1- 5, where 1 = strongly agree and 5 = strongly disagree)

Q34 How much money did YOU personally earn last year. Do not subtract the amount that you paid in taxes.

- o 0 - £9,999
- o £10,000 - £19,999
- o £20,000 - £29,999
- o £30,000 - £39,999
- o £40,000 - £49,999

- More than £50,000
- Prefer not to say

Q45 On the next screen you will see a job advertisement. (Please note, you will not be able to advance the page until after a short period of time has passed.)Please take a look at this job advertisement, and imagine it is for a job in a sector that you would work in.

Note: Participants were then randomized to see one of 24 job adverts below. There were 3 x 2 = 6 basic conditions: 2 framing conditions (promotion or prevention) x 3 pension conditions (no pension, 4% pension and 10% pension). These 6 basic combinations were further customized according to 4 different earnings bands (based on answers to Q34 above).

Q80 Manager roles at W.D.M. Plc Are you interested in a permanent full time role at a respected company? As part of the next phase of the company's development, we have a fantastic opportunity to join a busy and motivated team that will give the successful applicants a breadth of skills and experience in a fast-moving and challenging environment. If you have strong communication and problem-solving skills, then this is the opportunity for you. Our benefits package includes: Salary of £26,000 - £32,000, depending on experience 25 days holiday entitlement Subsidised staff canteen We believe that it is important to think about the future. Our benefits package is designed to help you reach your goals for the future, and to make your retirement everything you dream of. The successful candidate will be hard-working and have a desire to be successful. Please get in touch if you are interested in joining our team. Once you have read this job advertisement, please go to the next screen where we will ask for your impressions.

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Q4 We know that you don't have much information to go on, but thinking about this job, to what extent do you agree or disagree with the following statements?
(measured on a scale of 1 – 5, where 1 = strongly agree and 5 = strongly disagree)

- I would be interested in taking this job
- I would be interested in working for this company

Q42 Again, thinking about the job advert you just saw, if you were looking for a job how likely would you be to apply for this one?
(measured on a scale of 1 – 5, where 1 = extremely likely and 5 = extremely unlikely)

Q46 Now we want to ask about your perceptions of the values of the company in the job advert. A company's important values may be expressed in the form of norms or shared expectations about what's important, how to behave or what attitudes are appropriate. Again, we know that you don't have much to go on, but please indicate to what extent you believe each of the attributes below is characteristic of the organization in the job advert you saw.
(measured on a scale of 1 – 5 where 1 = not at all characteristic and 5 = highly characteristic)

- Stability
- Predictability
- Being supportive
- Being innovative
- Risk taking
- Opportunities for professional growth

Q43 Help us track our survey logistics! We are always looking for ways to optimize survey design and response collection. If you email this code: ${e://Field/random} along with your Prolific ID, to Rebecca Campbell who is a research student in the Management Department at LSE, we will pay you an additional £1 by bonus to your Prolific account. (Your email address will not be recorded or used for any purpose.)Continue to the next page whenever you are ready.

Q52 Here we ask about your beliefs about financial investments and savings. You don't need to look anything up, we are just interested in your gut understanding.

Q54 Suppose you had £100 in a savings account and the interest rate was 2 per cent per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (More than £102/ Exactly £102/ Less than £102/ Don't know/ Prefer not to answer)

Q16 Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy:

- More than today with the money in this account
- Exactly the same as today with the money in this account
- Less than today with the money in this account
- Don't know

- Prefer not to answer

Q55 Do you think that the following statement is true or false? "Buying shares in a single company usually provides a safer return than buying shares in a mutual fund" (True / False/ Don't know/ Prefer not to answer)

Q53 To encourage people to save for their retirement, the government gives people tax relief on their pension contributions. Do you know how much tax relief a basic rate tax payer gets from the government on their pension contributions/ (8%/ 12%/ 20%/ 40%/ Don't know)

Q56 In 2016 how much will the new state pension provide for a single person per week? (£115/ £155/ £250/ £324/ Don't know)

Q44 Here are a number of statements that may or may not apply to you. There are no right or wrong answers, so just answer honestly, considering how you compare to most people. (measured on a scale of 1 – 5 where 1 = very much like me and 5 = not like me at all)

- New ideas and projects sometimes distract me from previous ones.
- Setbacks don't discourage me. I don't give up easily.
- I often set a goal but later choose to pursue a different one
- I am a hard worker.
- I have difficulty maintaining my focus on projects that take more than a few months to complete.
- I finish whatever I begin.
- My interests change from year to year.
- For this option, please mark not much like me.
- I am diligent. I never give up.
- I have been obsessed with a certain idea or project for a short time but later lost interest.
- I have overcome setbacks to conquer an important challenge.

Q59 *Note: this question and the next question, and the definition of wealth question, are for some secondary analyses about judgments and how these relate to work preferences. Now we want to ask for your opinion. When Steve and Jeffrey graduated from college three years ago, each of them had no savings and no debt. They both moved to a medium sized city, and found a job that pays £3,000 a month after taxes. Three years later, both are still working in the same job, and earning the same amount of money. Steve generally splits his income in the following manner. Each month he spends £1,250 on rent for a 2-bedroom apartment, and £550 for petrol, insurance, car payments, and train travel. Steve spends about £250 a month on groceries, usually shopping at Whole Foods, a premium healthy supermarket. He buys lunch at cafes or restaurants near his office most days, and goes out with friends often, spending about £200 a month eating out. He budgets £100 a month for clothes, and £150 monthly toward a travel fund for his two annual vacations. Steve spends another £350 for all other expenses each month. Jeffrey generally splits his income in the following manner. Each month he spends £850 on rent for a modest 1-bedroom apartment, and £300 for petrol, insurance, car payments, and train travel. Jeffrey

spends about £200 a month on groceries, usually shopping once or twice a week at his local discount supermarket, Lidl. He brings a packed lunch to work most days, but does go out with friends only on occasion, spending about £100 a month eating out. He budgets £50 a month for clothes, and £100 monthly toward a travel fund for his annual vacation. Jeffrey spends another £350 for all other expenses each month. In your opinion, which of these individuals is wealthier?

- Steve is much wealthier
- Steve is somewhat wealthier
- Steve is slightly wealthier
- They are equally wealthy
- Jeffrey is slightly wealthier
- Jeffrey is somewhat wealthier
- Jeffrey is much wealthier

Q61 Below you see the same information about Steve and Jeffrey that you just saw (it appears again here for your reference). Now you are asked a different question: Which of these individuals is more similar to a typical wealthy person?

When Steve and Jeffrey graduated from college three years ago, each of them had no savings and no debt. They both moved to a medium sized city, and found a job that pays £3,000 a month after taxes. Three years later, both are still working in the same job, and earning the same amount of money.
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Which of these individuals is more similar to a typical wealthy person?

- Steve is much more similar to a typical wealthy person
- Steve is somewhat more similar
- Steve is slightly more similar
- They are equally similar to a typical wealthy person
- Jeffrey is slightly more similar
- Jeffrey is somewhat more similar
- Jeffrey is much more similar

Q63 Please give a brief definition of wealth. What is wealth? What does it mean to be wealthy?

Q11 What is the highest level academic qualification that you have obtained?

- No formal qualifications
- Secondary school/ GCSE
- College/ A levels
- Undergraduate degree
- Graduate degree (MSc or PhD)

Q13 How many A levels grade A - C did you get?

- none
- 1 - 2
- 3 or more
- Prefer not to say
- Click to write Choice 5

Q14 What grade degree did you get?

- 1st
- 2:1
- 2:2
- 3rd or below
- Prefer not to say

Q15 what was the highest grade you received for either your undergraduate or graduate degree

- 1st/distinction
- 2:1/ merit
- 2:2/pass
- 3rd or below
- I prefer not to say

Q47 How many jobs have you had in the last 5 years?

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

Q48 If you'd like to explain the answer above, you can do that here (if not, please continue to the next page.)

Q66 Imagine that you had an unexpected expense of £1,500 such as a necessary car repair or a medical bill. How likely is it that you would be able to pay this bill in full and on time without having to borrow money or charge it to a credit card?
(Measured on a scale of 1 – 9, where highly unlikely = 1, and highly likely = 9)

Q112 What is your workplace style? Pick one group of characteristics that is most like you and drag it across into the box on the right.

- Cautious, Precise, Deliberate, Questioning, Formal
- Sociable, Dynamic, Demonstrative, Enthusiastic, Persuasive
- Caring, Encouraging, Sharing, Patient, Relaxed
- Competitive, Demanding, Determined, Strong-Willed, Purposeful

Q29 How old are you?

Q30 What is your gender? (Male/ Female/ Other)

Q116 What is your ethnic group? Chose one option that best describes your ethnic group or background

- White
- Asian/ Asian British
- Black/ African/ Caribbean/ Black British
- Mixed/ Multiple ethnicity
- Any other ethic group
- Prefer not to say

Q118 At the conclusion of this survey, you'll be automatically redirected back to the Prolific.ac website with a completion code. If you think the automatic redirection may not work (for instance, on some mobile devices), you can instead click on this link, or copy and paste it in a new
Q40 The End. Thank you for your participation in this survey, your feedback is very helpful. If you have any comments or questions please let us know below, or contact Heather Kappes, H.Kappes@lse.ac.uk

Appendix B.4 2 by 3 ANOVA of effect of pension condition and regulatory condition, controlling for age, on perceptions of stability

Table B.4.1 *Test of between subjects effect: dependent variable perceived stability controlling for age*

Source	*df*	*SS*	*MS*	*F*	*p*	*Partial eta squared*
Intercept	1	1163.40	1163.404	2697.553	.000	.782
Age	1	9.34	9.337	21.650	.000	.028
Pension condition	2	.821	.411	.952	.386	.003
Regulatory condition	1	.033	.033	.077	.782	.000
Pen.con*Reg con	2	.25	.127	.295	.745	.001
Error	750	323.46	.431			
Total	757	10147.88				
Corrected Total	756					

R^2 = .031

Appendix B.5 2 x 3 ANOVA of effect of pension condition and regulatory condition, controlling for age, on perceptions of innovation

Table B.5.2 *Test of between subjects effect: dependent variable perceptions of innovation*

Source	*df*	*SS*	*MS*	*F*	*p*	*Partial eta squared*
Intercept	1	741.47	741.47	1712.97	.000	.695
Age	1	2.28	2.28	5.26	.022	.007
Pension condition	2	1.58	.79	1.83	.162	.005
Regulatory condition	1	.06	.06	.14	.711	.000
Pen.con*Reg con	2	.19	.10	.22	.804	.001
Error	750	324.64	.43			
Total	757	8604.78				
Corrected Total	756	328.68				

R^2 = .012

Appendix B.6 Regression of grit score and educational level onto perceived attractiveness of job

Table B.6.1 *Linear regression of perceived attractiveness of job as a function of Grit, Education and the interaction.*

	Unstandardized coefficients			
	b	*SEb*	*t*	*p*
Constant	2.763 (.45 – 5.08)	1.174	2.353	.019
Grit score	-.038 (-.11 - .03)	.034	-1.114	.266
Education	-.093 (-.73 - .55)	.324	-.286	.775
Interaction Grit*Education	.008 (-.01 - .03)	.009	.896	.371

Note: $R^2 = .042$
Note: Confidence intervals are reported in parentheses
Note: Grit score was scored from 10 to 50 where higher scores represent more 'Grit'.
Note Education was an ordinal level variable, scored from 1 – 5, where 1 = no formal qualifications and 5 = Graduate degree.
Note: Perceived attractiveness of the job is scored 1 – 5 where higher scores indicate less interest in the job.
Note: No pension is the base case for the dummy variables: 4% pension and 10% pension

Appendix C Appendices for chapter 7

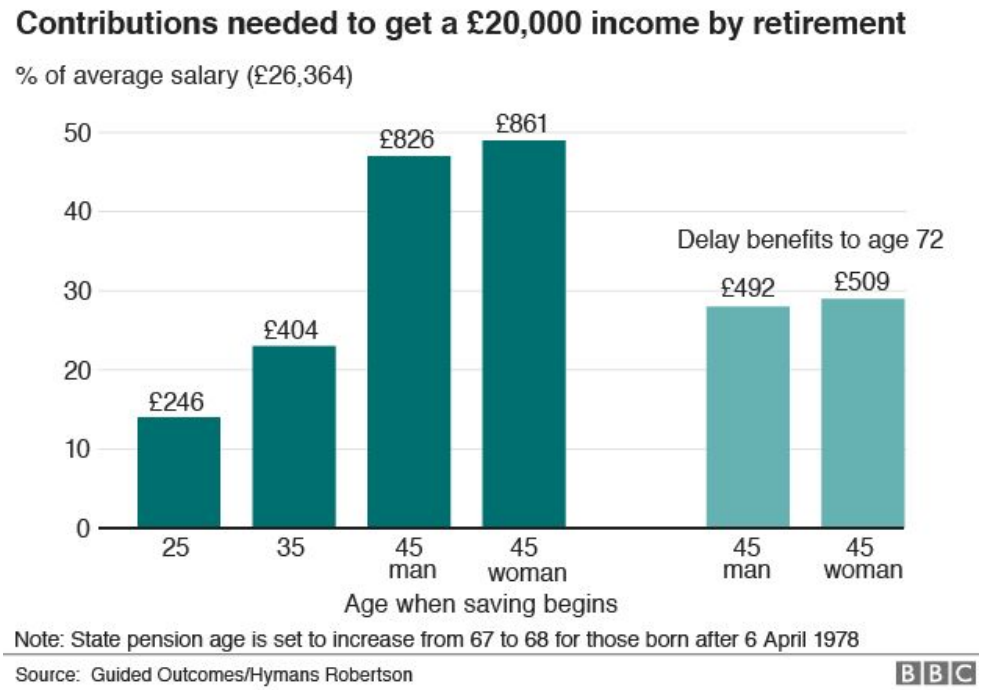
Appendix C.1 Full text of messages for experiments in chapter 7 and 8

Fear message:
(Note: this was the final fear message used in the study)

How to get a pension of £20,000 by the time you retire
By Brian Milligan
Personal Finance reporter BBC News

We keep being told to save more for our retirement.
But how big a pension will we need, and how much should we be putting away to pay for it?
On the first question, one clue came from the Office for National Statistics (ONS) this week, which said the average retired household now spends £21,770 a year.
So to earn a pension of at least £20,000, how much should you be saving each month?
To get an answer, the BBC asked a firm of actuaries to make some calculations.
To a generation that has got out of the habit of saving, the figures may come as something of a shock.
They reveal that even at the age of 25, you need to be putting away several hundred pounds a month. And if you haven't started saving by the age of 40, reaching the target is going to be a real challenge.

If you qualify for a full state pension - and initially many people will not - the government currently gives you just over £8,000 a year.
So assuming you are not a member of a defined benefit (DB) pension scheme (this is the type of pension normally found in the public sector), you will need to find at least £12,000 of income from a defined contribution (DC) scheme.
For those on the average salary of £26,364, getting such a pension needs very careful planning." Twenty thousand pounds on average national earnings is quite an ambitious target," says Patrick Bloomfield, a partner at Hymans Robertson LLP, which did the calculations for the BBC."



The table above shows how much money a worker would have to contribute every month to get an eventual pension of £20,000 a year, depending on the age they start saving.
So someone who starts saving at the age of 25 would need to put away £246 a month, net of tax.
After 20% tax relief, that sum is actually worth £307.
The pot would eventually be used to buy an annuity, or income for life.
Assuming it achieves investment growth of a typical default investment strategy, and assuming the eventual payout increases annually with inflation, as well as granting a 50% income to a surviving partner, this level of saving has a 50/50 chance of providing an annual income of £20,000 or more.

Challenge

The figures show that an average earner who starts saving at 25 need only contribute 14% of their salary to hit the £20,000 target.
But if they leave it to the age of 35, they will need to contribute 23%.
By the time they are 45, if they haven't started a pension plan, they will need to pay in pretty much half their earnings, a difficult task.
"The biggest message from this analysis is the cost of delaying when you start to save," says Patrick Bloomfield.
"The challenge is, when they're in their 20s and 30s people are trying to save, they're trying to get on the housing ladder, they're being young and having fun. There are lots of calls on that money."
However, the figures show that there is an alternative option for those who haven't started saving by the age of 45.
If they are prepared to delay taking the income for five years beyond their current state pension age, they can reduce their contributions to £418 a month, or 28% of their earnings.

But not many people will want to be working at the age of 72. Indeed, some will find that ill health stops them doing so anyway.

'Seismic savings shift'
The figures we used are a clear sign that workers need to save more.
One financial advisory firm, the deVere Group, said this week that 80% of the people it sees are not saving enough.
"Too many people have a live-for-today attitude," said chief executive Nigel Green.
"There needs to be a seismic shift in the savings attitude".

Alternative Fear Message used in Pilot 2
(Note: This message was not used in the final study)

Britain faces old age poverty timebomb as one in five put NOTHING in a pension

- Just 46% save the minimum needed for a comfortable old age
- Most people hope for £24,500 to have a decent standard of living

Paying the price: A growing number of people will find they have not saved enough to meet the cost of living upon retirement.

A fifth of workers are putting nothing into a personal pension, threatening poverty in old age.

The maximum basic state pension is currently £159 per week. Could you live on this?

People are sacrificing saving for their retirement in favour of covering immediate bills such as mortgages, heating and food.

The proportion of those who are saving the minimum needed into a personal pension to provide a comfortable old age has fallen to an all-time low of 46 per cent.

This is down from 51 per cent in 2010 and 54 per cent in 2009, according to figures published by pension experts Scottish Widows.

At the same time, one in five people over 30 have put nothing aside to provide any pension above that provided by the state.

Scottish Widows calculates that workers need to save at least 12 per cent of their income into a pension each month to ensure they have a comfortable retirement.

Warning signs: Most people would need a pension pot of £516,000 to provide an annual retirement income of £16,500.

It said most people are hoping for a retirement income of £24,500 in order to provide a decent standard of living.

Based on a state pension of just over £8,000 a year, this means they have to find another source to provide the remainder £16,500 of annual income.

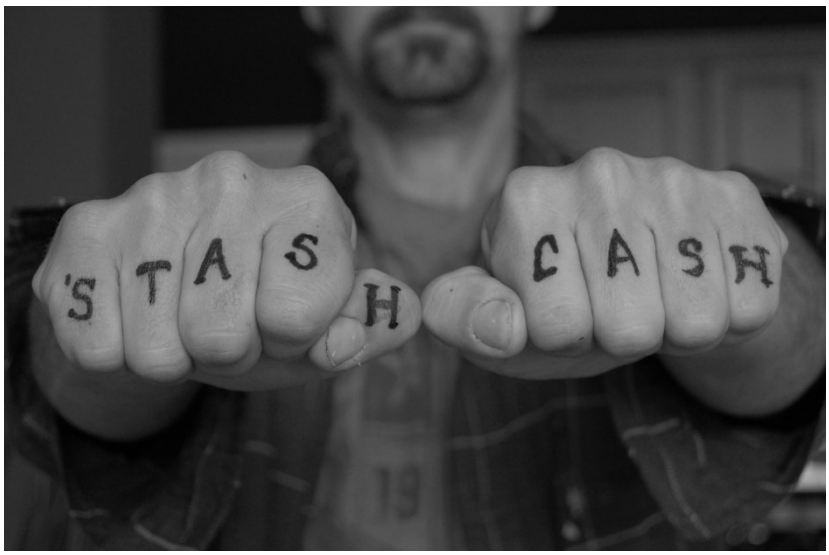
However in today's financial climate, a worker would need to have a pension pot of over half a million pounds to buy an annuity that would offer an income of this scale.

This is much higher than the average pension pot that most workers are likely to have

based on their current savings patterns.

Scottish Widows said the Government needs to take urgent steps to alert individuals to this pensions timebomb.

Positive affect message



Getting Rich: from Zero to Hero in One Blog Post

Hi there. If we haven't met, my name is Mr. Money Mustache. I'm the freaky financial magician who retired along with a lovely wife at age 30 in order to start a family, as well as start living a great life. We did this on two normal salaries with no lottery winnings or Silicon Valley buyout windfalls, by living what we thought was a wonderful and fulfilling existence. It was only after quitting the rat race that we looked around and realized why we had become financially independent while most people, even with higher incomes, end up stuck needing to work until age 65 or later.

We'll start with a rant. For almost six years, I've been preaching a different brand of financial advice from what you see in the newspapers and magazines. The standard line is that life is hard and expensive, so you should keep your nose to the grindstone, clip coupons, save hard for your kids' college educations, then tuck any tiny slice of your salary that remains into a pension plan. And pray that nothing goes wrong in the 40 years of career work that it will take to get yourself enough savings to enjoy a brief retirement.

Mr. Money Mustache's advice? Almost all of that is nonsense: Your current middle-class life is an Exploding Volcano of Wastefulness, and by learning to see the truth in this statement, you will easily be able to cut your expenses in half – leaving you saving half of your income. Or two thirds, or more. Sound like a fantasy? Not to readers of this blog.

What happens when you can save more of your income? As it turns out, spending much

less money than you bring in is the way to get rich. The ONLY way.
And the effects are surprising: if you can save 50% of your take-home pay starting at age 20, you'll be wealthy enough to retire by age 37. If you already have some assets now, you're even closer than that. If you can save 75%, your working career is only 7 years. So remember my freaky magician story up in the first paragraph? There was not really any magic – my wife and I just saved about 66% of our pay without really noticing it, and in under ten years we woke up and realized we didn't have to work for a living any more. Our son was born shortly afterwards, and he's about to have his eleventh birthday party. And we're still going strong.

But how can you save so much?
The bottom line is this: by focusing on happiness itself, you can lead a much better life than those who focus on convenience, luxury, and following the lead of the financially illiterate herd that is the TV-ad-absorbing Middle Class of the United States (and other rich countries) today. Happiness comes from many sources, but none of these sources involve car or handbag upgrades.

No matter what the herd or the TV set tells you, this is the truth. Far from being a social outcast, this new perspective will make you a hero among your friends. This is not a fringe activity anymore – millions of people are fixing their lives these days. And the earlier you can accept it, the sooner you will be rich.

Is that all too fluffy and philosophical? OK, fine. Here's how to cut your life costs in half. Live close to work. Move to another city if you enjoy adventure. Don't borrow money for cars, and don't buy stupid ones. Ride a bike wherever you can. Cancel your TV service. Stop wasting money on groceries. Give your kids the opportunity to achieve greatness without being pampered. Lose the overpriced cell phones. Learn to appreciate the life-boosting joy of using your own body to get things done. Learn to mock convenience. Practice optimism.

That should do it – about half of your expenses, gone in one paragraph. Keep going, as many readers do, and you can save closer to 75% of what you make – especially for those with above-average incomes.

But then what do I do with all the money?
You invest it. In stock index funds, in your pension, in paying off your own house, in rental houses if you are interested in local real estate, and in other sources as you continue to learn about making money work for you. As of 2016, my own retirement income comes from a dead-simple asset allocation: a bunch of index funds at Vanguard and Betterment which pay quarterly dividends.

How long will the money last?
If you can get 25 times your annual spending saved up and working for you, that is enough to live off – forever. Don't worry about the details – just do the saving for now, and watch as your lifestyle transforms and your worries about safety melt away. This blog is not so much a financial nuts-and-bolts blog as it is a story about lifestyle and attitude

transformation. And believe it or not, your attitude determines your lifetime wealth much more than your knowledge of financial nuts and bolts.
So welcome! I'm glad you're here, and let's get started.

Emotionally neutral message

Pensions – a guide to the basic facts

There are three main types of pension:

- The State pension
- Defined benefit pensions, and
- Defined contribution pensions

The State Pension

Most people get some State pension. It's paid by the government and is a secure income for life which increases by at least the rate of inflation each year.

You build up your entitlement to the State Pension by making National Insurance contributions during your working life.

From April 2016 a new flat rate State Pension was introduced. For the current tax year 2017/2018 the full new state pension is £159.55 per week (per person).

Defined Benefit pension

You're most likely to have a defined benefit (DB) pension if you work in the public sector or for a large company.

This is a salary-related pension which pays out a secure income for life and increases each year.

The pension you get is based on how long you've been a part of the scheme and how much you earn.

Defined contribution pension

With this type of scheme you build up a pension pot which you can draw a retirement income from.

The amount that builds up depends on:

- The level of charges you pay

- How well your investment performs, and
- How much you and your employer (if you are employed) pay into the scheme

Defined contribution (DC) pensions include workplace, personal and stakeholder pension schemes.

The advantages of saving into a pension

Once you've decided to start saving for retirement, you need to choose how to do so.

Pensions have a number of important advantages that will make your savings grow more rapidly than might otherwise be the case.

A pension is basically a long-term savings plan with tax relief.

Your regular contributions are invested so that they grow throughout your career and then provide you with an income in retirement.

Generally, you can access the money in your pension pot from the age of 55.

Advantage 1: How tax relief tops up your pension

Once your income is over a certain level, the government takes tax from your earnings.

You can see this on your payslip. If you put money into a personal pension scheme, it qualifies for tax relief.

This means that as well as the money you're putting in, some of your money that would have gone to the government as tax now goes into your pension pot instead.

The government will still put tax relief into your pension pot, even if your income is too low to pay tax.

Advantage 2: The top-up from your employer

To help people save more for their retirement, employers are gradually being required to enrol their workers into a workplace pension scheme if they are not already in one.

If your work gives you access to a pension that your employer will pay into, then unless you really can’t afford to contribute or your priority is dealing with unmanageable debt, staying out is like turning down the offer of a pay rise.

Of course, if your employer will contribute to your pension regardless of whether you pay into it, then you should join the scheme whatever your financial circumstances.

Advantage 3: A tax-free lump sum when you retire

You can usually take up to a quarter of your pension savings as a tax-free lump sum (once you reach age 55).

If you've built up your own pension pot in a defined contribution scheme (as opposed to a salary-related pension scheme) you can then use the rest of your pot as you choose from age 55 onwards.

Advantage 4: Invest for the long-term

Finally, don't shy away from investing in shares.

You want your investments to grow, and that's difficult to achieve if you only choose lower-risk investments such as cash or bonds. Your pension will be mainly invested in shares.

Shares have historically performed better than cash or bonds over the longer term, but be aware that there are no guarantees they'll always do that.

Why save into a pension

Pensions might seem complicated but the basic idea is a simple one. It's worth understanding their benefits, because you might want to save more to top up your State Pension.

When you have finished reading, please click the arrow below. (Please note the arrow will not appear for a couple of minutes to give you time to read the text).

Appendix C.2 Survey

Block 1: Introduction
Q1 Welcome!
This is a study about how people feel about saving for the future. Your participation in this study is entirely voluntary. Participation presents minimal to no risks. The information you provide will be completely anonymous, because we do not ask for your name or any information that could identify you personally. However, this data will be available to other researchers. You may stop the study at any time, but you will only be paid if you finish all of it. If you have questions about this research study or what you are being asked to do, please ask for an explanation before you agree to participate.
Rebecca Campbell Department of Management London School of Economics and Political Science (LSE) r.m.campbell@lse.ac.uk

- I have read and understood the above consent form and desire of my own free will to participate in this study. (1)

Q2 Before you start, please switch off phone/ email/ music so you can focus on this study! Thank you! Please enter your prolific ID here:

Here participants randomized to see one of the three informational conditions, or the control group (Blocks 2,3,4 &5)

Block 6 positive affect (PANAS)

Q12 Below you will see a number of words that describe different feelings and emotions. Read each word and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now at the present moment.
(excited/strong/enthusiastic/proud/alert/inspired/determined/attentive/active/interested)
(Measured on a scale of 1 = very slightly or not at all - 5 = extremely)

Block 7 DV: Danger control responses (attitudes, intentions and hypothetical)

Q13 The next set of questions ask you about your attitudes and intentions around saving for retirement.
How do you feel about an occupational pension (the pension you get through your employer) as a way to save for retirement?
(Measured on a scale of 1 – 7 where 1 = extremely bad and 7 = extremely good)

- Saving in a pension is a good way to provide for retirement
- My workplace pension is a good way to save for retirement
- An occupational pension is good way to save for retirement

Q14 In this question you are presented with an imaginary scenario and asked to make a choice. This is a hypothetical decision but please do your best to think about how you would react if you were in this situation now.

Imagine that you have just started a job with a salary of £35,000 and will be auto enroled into your company's defined contribution pension scheme. A total of 8% will be put into your pension (made up of 4% from you, 3% from your employer and 1% in tax relief). You have been asked if you would like to make *additional* pension contributions (note these will not be matched by your employer, but you will get the tax relief). What would you do if you had to make this choice now?

- I would make additional contributions
- I would not make additional contributions
- I don't know

Block 8 DV: Fear control response: defensive avoidance

Q15 Some people are very proactive about their pension, others avoid thinking about it completely. How would you say you were?

Q16 When I hear about pensions my first instinct is....

- To think about it
- Not to think about it

Q17 When I hear about pensions it makes me....

- Want to do something about saving for my retirement
- Not want to do something about saving for my retirement

Block 9 Fear control responses (issue derogation and perceived manipulation)

Q18 Now we want to ask you about the message you read earlier which was about saving for the future. What did you think about it?
(Measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)

- The message I just read was overblown
- The message I just read on saving was exaggerated
- The message I just read was overstated
- The message I just read was manipulative
- The message I just read was misleading
- The message I just read was distorted

Block 10 DV: Value placed on a pension

Q19 In the following questions we ask you to imagine that you have been job hunting and that you have been offered a number of jobs that come with different reward packages. We will then ask you to say how attractive you find these reward packages. Please imagine that everything else about the jobs is the same, the only difference is in their reward packages.
For your information: a ***defined benefit*** pension is the type of pension, common in the public sector, which pays out a secure retirement income for life which increases each year in line with inflation. The pension amount is based on how long you have worked for your employer, and the salary you have earned (for example it might be two thirds of your final

salary).

In contrast, a ***defined contribution*** pension, common in the private sector, is where you and your employer contribute into a fund that is invested on your behalf. When you retire what you have to live on will depend on the value of this fund.

When you are ready, please click next.

Q20 Imagine that you have been offered two different jobs. You like them equally, the only difference between them is in the pay and pension. One has a *defined benefit* pension and one has a *defined contribution* pension. In both cases assume that you do not have to contribute anything to the pension in order to get the employer pension contribution.

Please say how attractive you find these two reward packages compared to each other (where 0 is terrible and 100 is excellent).

- Salary of **£26,000** and a generous **defined benefit** pension
- Salary of **£35,400** and a **defined contribution** pension into which your employer will pay 3% of your salary

Q22 Now imagine that you have been offered another three jobs. Again you like them equally and again the only difference between them is in the pay and pension they offer. This time they all come with the same type of pension - defined contribution. As before please assume that you do not have to contribute anything to the pension in order to get the employer contribution.
Please say how attractive you find these three reward packages compared to each other (where 0 is terrible and 100 is excellent).

- Salary of £35,400 plus employer pension contributions of 3% of salary
- Salary of £33,200 plus employer pension contributions of 10% of salary
- Salary of £30,400 plus employer pension contributions of 20% of salary

Q25 Finally imagine that you have been job hunting and that you have been offered a number of alternative jobs with varying financial packages. Again imagine that you like the jobs equally, the only difference is in the pay and pension they offer. With this set of choices the more that you put into your pension, the higher the total value of the financial package. However, this means you will have less money now. (Note the total cost to the employer of providing these financial packages is the figure at the end in brackets). If you had to choose one job package now, which one would you go for?

1. Basic salary of **£31,500** plus an employer pension contribution of a further 30% (Total value: £40,950)
2. Basic salary of **£32,250** plus an employer pension contribution of a further 25% (Total value: £40,313)
3. Basic salary of **£33,000** plus an employer pension contribution of a further 20% (Total value: £39,600)

4. Basic salary of **£33,750** plus an employer pension contribution of a further 15% (Total value: £38,813)
5. Basic salary of **£34,500** plus an employer pension contribution of a further 10% (Total value: £37,950)
6. Basic salary of **£35,250** plus an employer pension contribution of a further 5% (Total value: £37,013)
7. Basic salary of **£36,000** plus no employer pension contribution (Total value: £36,000)

Block 11 money allocation task

Q26 Imagine that you have unexpectedly received £1,000 and have to choose what to do with it. How would you allocate it among the four options below? (Please note that your answer must total to £1,000)

- Use it to buy something nice for someone special
- Invest it in my retirement fund
- Plan a fun and extravagant occasion
- Put it into my current account

Block 12 Mediator susceptibility, severity, fear

Q27 In this section we want to ask you a few questions about your feelings around saving for the future. We know it is a long way off, but please give your gut response.

Q28 Do you think you are at risk of not saving enough for retirement?
(Measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)

- It is likely that I will not save enough for retirement
- I am at risk of not saving enough for retirement
- It is possible that I will not save enough for retirement

Q29 Do you think that a lack of saving for retirement is a serious problem?
(Measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)

- I believe that under saving for retirement is serious problem
- I believe that it would be very hard to rely on the state pension only in retirement
- Please answer somewhat agree to this question
- I believe that having no private savings for retirement would be a very bad idea

Q30 Does the thought of not having enough money in retirement frighten you?
(Measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)
I am frightened that I might not have enough to live on when I am older
The thought of having to rely on the state pension in retirement is scary
The thought that I might run out of money when I am older is frightening

Q31 Below you will see a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.
(Measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)
(Frightened/ scared/ anxious)

Block 13 Mediator expectancy, instrumentality and valence

Q32 Now we want to ask you a few questions about how in control you feel of your finances
(Measured on a scale of 1 – 7 where 1 = extremely difficult and 7 = extremely easy)

- How easy is it for you to save towards your pension?
- How easy would it be for you to increase your pension saving?
- How easy would it be for you to cut back on your day to day spending?

Q33 To what extent do you agree with the following statements?
(Measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)

- The tax relief given on pension saving make it good value for money
- In the long run investing in shares should return more than saving in cash
- In the long run saving in an occupational pension scheme will generate a good return on the money invested
- I trust my occupational pension fund to invest my money well
- The employer match means that saving in a pension is a good way to invest for the long term

Q34 Suppose you have a choice between the following options of how to spend the money you earn during your lifetime. Which option would you like most? (Please answer the question as if prices remained constant, i.e. if there was no inflation.)
For clarity we have made a table here which summarises the six options

	Monthly spending during working life (age 25 until retirement)	Monthly spending during Retirement
Option A	£2,950	£1,900
Option B	£2,900	£2,200
Option C	£2,800	£2,500
Option D	£2,750	£2,750
Option E	£2,650	£3,200
Option F	£2,600	£3,600

Q35 Many people find financial choices confusing. So in this section we ask you a few questions to gauge how much you know about pensions and savings. You don't need to look anything up, we are just interested in your gut response. If you don't know, please don't guess, please select 'Don't know'.

Q36 In general, from the employees' perspective, which is considered a better type of pension, defined benefit or defined contribution?

- Defined benefit
- Defined contribution
- Don't know

Q37 To encourage people to save for their retirement the government gives employees tax relief on their pension contributions. Do you know how much tax relief a basic rate taxpayer gets from the government on their pension contributions? 8%/ 12%/ 20%/ 40%/ Don't know.

Q38 When you reach retirement and take the money out of your pension the government lets you take out a certain amount tax free. Do you know what percentage it is that you can withdraw tax free? 15%/ 25%/ 40%/ You can take it all tax free/ Don't know.

Q39 Currently, roughly how much does the maximum Basic State Pension in the UK provide per week for a single person (in other words if you have no private pension savings how much will the UK state currently provide you to live on)?

- £128 per week
- £159 per week
- £189 per week
- £229 per week
- £249 per week

Q40 Finally, please answer a few questions about yourself.

Q41 Approximately how many years have you spent in paid work (do not count unpaid work or volunteering)?

- less than one year
- one to five years
- more than five years

Q42 How much money did you personally earn last year? Do not subtract the amount that you paid in taxes.

- 0 - £9,999
- £10,000 - £19,999
- £20,000 - £29,999
- £30,000 - £39,999
- £40,000 - £49,999
- more than £50,000

Q43 Imagine that there was a ladder that represented where people stand in our society. At the top of the ladder are the people who are the best off, those who have the most money, most education, and best jobs. At the bottom are the people who are the worst off, those

who have the least money, least education, and worst jobs or no job. Please mark below where you think best represents where you stand on that ladder
(Measured on a scale of 1 – 10 where 1 = Top of the ladder (i.e. the most money, most education, the best jobs) and 10 = Bottom of the ladder (i.e. the least money, least education, the worst or no jobs))

Q44 How stable do you feel that your income flow will be in your future career?
Measured on a scale of 1 – 5, where 1 = very unstable and 5 = very stable)

Q45 Are you currently saving in an occupational pension?
- yes
- no
- I don't know

Q46 Do you know if you have a defined benefit or a defined contribution pension?
- I have a defined benefit pension
- I have a defined contribution pension
- I don't know

Q47 Do you know what percentage of your salary your employer contributes to your pension?
- Yes, please enter amount (in percentage terms)
- No

Q48 Do you know what percentage of your salary you contribute to your pension
- Yes, please enter amount (in percentage terms)
- No

Q49 How likely are you to <u>increase</u> your saving in a pension in the next year?
Measured on a scale of 1 – 7 where 1 = Extremely unlikely and 7 = Extremely likely)

Q50 How likely are you to start saving in a pension in the next year?
(Measured on a scale of 1 – 7 where 1 = Extremely unlikely to 7 = Extremely likely)

Q51 How old are you?

Q52 What is your gender?
- Male
- Female
- I prefer not to say

Q53 Finally, please consider the following thought experiment: Imagine that you must choose between two worlds that are identical in every respect except one. In world **A** you will live in a 4,000–square-foot house, and others will live in 6,000-square-foot-houses. In world **B** you will live in a 3,000-square-foot house, others in 2,000-square-foot houses. Which world would you prefer to live in?

- World A
- World B

Q54 The End. Thank you very much for your participation. If you would like to receive some follow up information tick the option below.
Yes, I would like some follow up information
No, I would not like any follow up information

Q55 Comments (optional, but we would welcome any feedback you had on this survey)

Appendix C.3 Description of the Pilot Studies

The first pilot study

Before conducting the main study, a pilot study (n= 39) was carried out to test the survey instrument and whether the 'fear' and 'positive affect' messages did in fact lead to increased levels of fear and positive affect. Participants were paid £2.50 and were recruited though Prolific. They were pre-screened to be aged 22 – 32, not a student, in full time work and resident in the UK. This pilot study used three measures to capture the impact of the fear Message. Fear was measured with a 'threat index' and a 'fear index' as well as a negative mood index. Positive affect was measured using the PANAS scale (Watson et al. 1998). Running a one-way analysis of variance using SPSS Generalized Linear model in most cases the direction of the results went in the direction predicted however as sample size was very small these did not approach significance.

The second Pilot study

A second fear message was designed (see below for full text of the message) and was piloted with a larger sample (n = 90) to compare two alternative fear messages, against the emotionally neutral message. The positive affect message was not tested. The second alternative fear message was based on an article in the MailOnline ("Britain faces old age poverty timebomb as one in five put NOTHING in a pension"[112]) and had even more alarmist (but accurate) figures about how much people need to save as well as emotive images of old people and money.

Participants were paid £1 and were recruited though Prolific. They were pre-screened to be aged 33 -37, not a student, in full time work and resident in the UK. As before, fear was measured with a 'threat index' and a 'fear index' as well as a negative mood index.

The results of this second pilot again showed that there was no statistically significant impact of the message read on the levels of fear as measured by the threat index: $F(2,87) = 2.19$, $p = .118$ or the fear index $F(2,87) = 1.17$, $p = .316$. Regardless of condition, on average respondents scored highly in the fear index (in the sense that the

---

[112] http://www.dailymail.co.uk/news/article-2147346/Britain-faces-old-age-poverty-timebomb-NOTHING-pension.html Published: 01:37, 21 May 2012) accessed on 18.9.17

thought of not having enough money in retirement frightened them) with a mean score of 18.06 on the fear index (SD = 3.12) (which was scored from a minimum of 3 to a maximum of 21).

However, with regard to the negative mood index, there was a statistically significant impact of the message on mood, $F(2,87) = 3.94$ $p = .023$. Both the fear messages generated a higher score (in the sense that participants reported a more negative mood) compared to the emotionally neutral message. When participants were asked (with three items measured on a scale of 1 – 7, where 1 = strongly disagree and 7 = strongly agree) to say to what extent they felt frightened, scared and anxious, the mean score on mood was 14.43 for the first (original) fear message and 14.97 for the second fear message compared to a lower score of 11.62 for the emotionally neutral message (see below for output). Given that both fear messages generated similar results on the negative mood index, it was decided to use the first fear message.

Results of second Pilot study

Table: C.3.1
Means and standard errors of the Threat index, Fear index and Negative mood index

		Threat index	Fear index	Negative mood index
condition	n	*M (SD)*	*M (SD)*	*M (SD)*
Fear	30	35.57 (4.46)	18.07 (3.42)	14.43 (5.59)
Second fear	31	34.74 (5.18)	18.65 (2.48)	14.97 (4.81)
Emotionally neutral	29	32.90 (5.36)	17.41 (3.39)	11.62 (4.28)
total		$F(2,87) = 2.19$, $p = .118$	$F(2,87) = 1.17$, $p = .316$	$F(3,87) = 3.94$, $p = .023$.

Note: Threat index is scored from 6 - 42 where higher scores represent a higher perception of threat.
Note: Fear index is scored from 3 - 21 where higher scores represent more fear.
Note: Negative mood index is scored from 3 – 21 where higher scores represent a more negative mood.

Appendix C4 Details of salary calculations

For experiment 2 in chapter 7 pay levels were selected with reference to pay data from the Office of National Statistics ("ASHE table 6.7a 2016 provisional).

https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/agegroupashetable6

In 2016 pay data for those aged 22- 29:

Male: median full time earning for men were £23,686 (male)
This ranged from £14,942 at the 10th percentile to £39,204 at the 90th percentile.
Female: median full time earnings for women were: £21,653 (female).
This ranged from £13,505 at the 10th percentile to £35,019 at the 90th percentile/

The primary variable of interest was subjective value placed on the *trade-off* between pay and a pension, consequently the pay levels used in the study were at the upper end of this range.

In Q20, the option is either £26,000 plus generous DB pension (approximate total cost to employer is 26,000 plus pension cost of 40% = 36,400) or £35,400 plus pension of 3% (approximate total cost to employer is £35,400 plus 0.03% = £36,462).

This figure of £36,400 represents about 93% of pay at the 90th earning percentile for men.

Appendix C.5 Process output for valence as mediator

Test of mediation y= attitude to pensions, x = educational nudge, M = valence

Note: This output shows the statistical results for the test of valence as a mediator (M) of the impact that the educational nudge (X) had on attitudes to pensions (Y). The results were null, which is why they have not been reported in the main text.

The educational nudge had four categories (participants were randomised to see a fear message, a positive affect message, an emotionally neutral message or were put into a control group and saw no message). As normal when using regression with multi categorical predictor variables, dummy variables were created so that X1 = the fear message, X2 = the positive affect message X3= the emotionally neutral message with the control group as the reference category.

See the notes below in each section, for interpretation.

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.00 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : ATTPENS
    X  : CONDNUM
    M  : VALNCE

Sample
Size:  418

Custom
Seed:     30217

Coding of categorical X variable for analysis:
 CONDNUM      X1      X2      X3
   1.000    .000    .000    .000
   2.000   1.000    .000    .000
   3.000    .000   1.000    .000
   4.000    .000    .000   1.000

**************************************************************************
OUTCOME VARIABLE:
 VALNCE
Note: The results below report the results of the impact of the educational nudge
on valence. This is path 'a' in the statistical model figure 7-2 in chapter 7. The
results below show that the only group for whom there was a statistically
significant impact of the educational nudge on valence was X2 (the positive
affect message). Those participants who read the positive affect message,
compared to the control group, were predicted to score 0.538 higher in valence.

Model Summary
      R       R-sq        MSE          F        df1        df2          p
   .1411      .0199     2.4547     2.8036     3.0000   414.0000      .0395

Model
              coeff         se          t          p       LLCI       ULCI
constant     3.5648      .1508    23.6454      .0000     3.2685     3.8612
X1            .0217      .2152      .1009      .9197     -.4014      .4448
X2            .5380      .2137     2.5174      .0122      .1179      .9581
X3            .0816      .2180      .3745      .7082     -.3469      .5102

**************************************************************************
```

OUTCOME VARIABLE:
ATTPENS

Note: The results below report the results of the impact of the educational nudge on attitudes to pensions when including valence in the model.
These are paths: *C′₁ C′₂ and C′₃* and *b′* in the statistical model figure 7-2 in chapter 7.
The coefficient for VALNCE below (0.1592), which is pathway *'b'* (in the statistical model figure 7-2 in chapter 7), is an estimate of the effect of valence (M) on attitudes to pensions (Y) when controlling for x (the educational nudge participants read).
The results show that only X3 (the emotionally neutral message) had a statistically significant impact on attitudes to pensions when Valence is included in the model.

Model Summary

R	R-sq	MSE	F	df1	df2	p
.2078	.0432	11.7472	4.6587	4.0000	413.0000	.0011

Model

	coeff	se	t	p	LLCI	ULCI
constant	15.9139	.5056	31.4733	.0000	14.9200	16.9078
X1	.0151	.4709	.0320	.9745	-.9106	.9407
X2	-.3615	.4711	-.7675	.4432	-1.2875	.5645
X3	1.4752	.4770	3.0929	.0021	.5376	2.4128
VALNCE	.1592	.1075	1.4809	.1394	-.0521	.3706

********** TOTAL EFFECT MODEL **********
OUTCOME VARIABLE:
ATTPENS

Note: The results below report the results of the relative total effect of X on attitudes to pensions. In other words, they are the sum of the direct and indirect effect of each X on attitudes to pensions (*$C_j = C'_j + a_jb$ where C_j = the total effect, C'_j the direct effect and a_jb the indirect effect*). It is calculated by regressing attitudes to pension (Y) onto the dummy variables for X (the educational nudge) and leaving M (valence) out of the model. The omnibus test for the overall total effect model is statistically significant (*R^2 = .0381, p = .0011*). Those participants who read the emotionally neutral message (X3)are predicted to score 1.488 higher on attitudes to pensions than those in the control group.

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1952	.0381	11.7810	5.4648	3.0000	414.0000	.0011

Model

	coeff	se	t	p	LLCI	ULCI
constant	16.4815	.3303	49.9018	.0000	15.8323	17.1307
X1	.0185	.4716	.0393	.9687	-.9084	.9455
X2	-.2759	.4682	-.5893	.5560	-1.1962	.6444
X3	1.4882	.4776	3.1162	.0020	.5494	2.4270

********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **********

Relative total effects of X on Y:

	Effect	se	t	p	LLCI	ULCI
X1	.0185	.4716	.0393	.9687	-.9084	.9455
X2	-.2759	.4682	-.5893	.5560	-1.1962	.6444
X3	1.4882	.4776	3.1162	.0020	.5494	2.4270

Omnibus test of total effect of X on Y:

R2-chng	F	df1	df2	p
.0381	5.4648	3.0000	414.0000	.0011

Note: here the total effect is partitioned into the relative direct effect – i.e. pathway *C′* and the indirect effect (*a_jb*)

Relative direct effects of X on Y (pathway C′)

	Effect	se	t	p	LLCI	ULCI

```
X1      .0151      .4709      .0320      .9745     -.9106      .9407
X2     -.3615      .4711     -.7675      .4432    -1.2875      .5645
X3     1.4752      .4770     3.0929      .0021      .5376     2.4128

Omnibus test of direct effect of X on Y:
    R2-chng          F        df1        df2          p
      .0395     5.6863     3.0000   413.0000      .0008
----------

Relative indirect effects of X on Y
```

Note: this is calculated as the product of $a_j b$. This indirect effect is the test of mediation. As the sampling distribution of two regression coefficients is not normal, 95% bootstrap confidence intervals are used to test the effect. Given that the confidence intervals for the relative indirect effect of each X category on attitudes to pension (Y)contains zero, we conclude that there is no evidence to support the hypothesis that valence mediates the relationship between the educational nudge and attitudes to pensions.

```
 CONDNUM     ->    VALNCE      ->    ATTPENS

       Effect     BootSE   BootLLCI   BootULCI
X1      .0035      .0436     -.0961      .0945
X2      .0857      .0722     -.0450      .2463
X3      .0130      .0434     -.0767      .1094

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Appendix C.6 Moderation output

Note this output shows the statistical results for the test of fear as a moderator of the impact that the educational nudge (X) had on attitude to pensions (Y). The results were null, which is why they have not been reported in the main text.

The educational nudge had four categories (participants were randomised to see a fear message, a positive affect message, an emotionally neutral message or were put into a control group and saw no message). As normal when using regression with multi categorical predictor variables, dummy variables were created so that X1 = the fear message, X2 = the positive affect message X3= the emotionally neutral message with the control group as the reference category.

```
Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.3 *****************

          Written by Andrew F.  Hayes, Ph.D.        www.afhayes.com

**************************************************************************
Model = 1
    Y = ATTPENS
    X = CONDNUM
    M = FEARIND

Sample size
        418

Coding of categorical X variable for analysis:
 CONDNUM      D1      D2      D3
    1.00     .00     .00     .00
    2.00    1.00     .00     .00
    3.00     .00    1.00     .00
    4.00     .00     .00    1.00

**************************************************************************
Outcome: ATTPENS
Note: Moderation is shown by a significant interaction. The data below show that
the coefficients for the interaction terms (int_1, int_2, int_3) were not
statistically significant (with respective p values of .6443, .3440 and .5843).


Model Summary
          R       R-sq        MSE          F        df1     df2          p
      .2482      .0616    11.6053     4.2709     7.0000   410.0000      .0001

Model
             coeff         se          t          p       LLCI       ULCI
constant   16.4954      .3415    48.2995      .0000    15.8241    17.1668
FEARIND      .0371      .1923      .1931      .8470     -.3409      .4152
D1          -.0017      .5161     -.0033      .9974    -1.0163     1.0129
D2          -.3059      .4778     -.6403      .5224    -1.2452      .6333
D3          1.4284      .4397     3.2488      .0013      .5641     2.2927
int_1        .1020      .2206      .4621      .6443     -.3318      .5357
int_2        .2196      .2318      .9474      .3440     -.2361      .6752
int_3        .1180      .2155      .5475      .5843     -.3057      .5417

Product terms key:
 int_1     :       D1        X       FEARIND
 int_2     :       D2        X       FEARIND
 int_3     :       D3        X       FEARIND
```

R-square increase due to interaction:
Note: A test of moderation can also be done through a model comparison approach, where one compares the fit of a model without the interaction terms (i.e. without (int_1, int_2, int_3) to the fit of a model with the interaction terms, and computing the difference between their squared multiple correlations. As can be seen below the R2-chng was not significant (p =.7997).

R2-chng	F	df1	df2	p
.0057	.3355	3.0000	410.0000	.7997

****

Conditional effect of X on Y at values of the moderator:

Moderator value:
FEARIND -3.2265

	Coeff	se	t	p	LLCI	ULCI
D1	-.3306	.8615	-.3838	.7013	-2.0241	1.3629
D2	-1.0144	.9268	-1.0945	.2744	-2.8364	.8075
D3	1.0476	.8360	1.2532	.2109	-.5957	2.6910

Test of equality of conditional means at this value of the moderator

R2-chng	F	df1	df2	p
.0203	2.7911	3.0000	410.0000	.0402

Estimated conditional means at this value of the moderator

CONDNUM	yhat
1.0000	16.3756
2.0000	16.0450
3.0000	15.3612
4.0000	17.4233

Moderator value:
FEARIND .0000

	Coeff	se	t	p	LLCI	ULCI
D1	-.0017	.5161	-.0033	.9974	-1.0163	1.0129
D2	-.3059	.4778	-.6403	.5224	-1.2452	.6333
D3	1.4284	.4397	3.2488	.0013	.5641	2.2927

Test of equality of conditional means at this value of the moderator

R2-chng	F	df1	df2	p
.0360	6.8935	3.0000	410.0000	.0002

Estimated conditional means at this value of the moderator

CONDNUM	yhat
1.0000	16.4954
2.0000	16.4938
3.0000	16.1895
4.0000	17.9238

Moderator value:
FEARIND 3.2265

	Coeff	se	t	p	LLCI	ULCI
D1	.3273	.8967	.3650	.7153	-1.4355	2.0900
D2	.4026	.8463	.4757	.6345	-1.2610	2.0662
D3	1.8091	.8093	2.2354	.0259	.2182	3.4001

Test of equality of conditional means at this value of the moderator

R2-chng	F	df1	df2	p
.0194	3.2674	3.0000	410.0000	.0213

Estimated conditional means at this value of the moderator

CONDNUM	yhat
1.0000	16.6153
2.0000	16.9425

```
     3.0000    17.0179
     4.0000    18.4244

Moderator values are the sample mean and plus/minus one SD from mean

************************************************************************

Data for visualizing conditional effect of X on Y
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/CONDNUM FEARIND ATTPENS.
BEGIN DATA.

     1.0000    -3.2265    16.3756
     2.0000    -3.2265    16.0450
     3.0000    -3.2265    15.3612
     4.0000    -3.2265    17.4233
     1.0000      .0000    16.4954
     2.0000      .0000    16.4938
     3.0000      .0000    16.1895
     4.0000      .0000    17.9238
     1.0000     3.2265    16.6153
     2.0000     3.2265    16.9425
     3.0000     3.2265    17.0179
     4.0000     3.2265    18.4244

END DATA.
GRAPH/SCATTERPLOT=FEARIND WITH ATTPENS BY CONDNUM.

****************** ANALYSIS NOTES AND WARNINGS ************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 FEARIND

NOTE: Johnson-Neyman method not available with multicategorical X

NOTE: All standard errors for continuous outcome models are based on the HC3
estimator

------ END MATRIX -----
```

Appendix C.7 Notes on coding for chapter 7

All analysis was carried out on the data set: Fear_v_Hope_study_25.9.17_filtered.sav

For mediation:

The process macro automatically creates dummy variables where 1 is automatically selected to be the reference category. So that the reference category in this section was the control group I created a new variable, just for the process analysis, called CONDNUM where 1 = the control, 2 = fear, 3 = hope/positive affect, 4 = information. This meant that when the process tool created dummy variables the reference category was 1 = the control. 2 = fear became D_1 (or X1). 3 = hope became D_2 (or X2) and 4 = information became D_3 (or X3).

Appendix D Appendices for chapter 8

Appendix D.1 Survey

Fear v Hope study ages 33- 43 28.11.17 full questionnaire

Q1 **Welcome!**

This is a study about how people feel about saving for the future. Your participation in this study is entirely voluntary. Participation presents minimal to no risks. The information you provide will be completely anonymous, because we do not ask for your name or any information that could identify you personally. However, this data will be available to other researchers. You may stop the study at any time, but you will only be paid if you finish all of it. If you have questions about this research study or what you are being asked to do, please ask for an explanation before you agree to participate. Rebecca Campbell. Department of Management London School of Economics and Political Science (LSE) r.m.campbell@lse.ac.uk

- I have read and understood the above consent form and desire of my own free will to participate in this study.

Q2 Before you start, please switch off phone/ email/ music so you can focus on this study! Thank you! Please enter your prolific ID here:

Q3 Please read the article below. It will take about 2 - 3 minutes to read. Please note that you will not be able to advance the page until after a few minutes have passed as it is important that you read this in order to complete the rest of the survey.

Q12 Below you will see a number of words that describe different feelings and emotions. Read each word and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now at the present moment.
(measured on a scale of 1 – 5, where 1 = very slightly or not at all, and 5 = extremely)

- Inspired
- Determined
- Active
- Interested

Q31

- Frightened
- Scared
- Anxious

Q13 The next set of questions ask you about your attitudes and intentions around saving for retirement.
How do you feel about an occupational pension (the pension you get through your employer) as a way to save for retirement?
(measured on a scale of 1 – 7 where 1 = extremely bad and 7 = extremely good)

- Saving in a pension is a good way to provide for retirement
- My workplace pension is a good way to save for retirement

- An occupational pension is good way to save for retirement

Q14 In this question you are presented with an imaginary scenario and asked to make a choice. This is a hypothetical decision but please do your best to think about how you would react if you were in this situation now. Imagine that you have just started a job with a salary of £38,000. In addition, you will receive a further 20% (i.e. £7,600) for flexible benefits. You can use this 20% flexible benefit amount to pay into your pension, for other benefits such as private health insurance, or you can take it as cash. If you were in this situation now, how much of your total salary (including the additional 20%) would you allocate to your pension?

- I would not put anything into my pension
- I would put between 1 - 4% of my salary in my pension
- I would put between 5 - 8% of my salary in my pension
- I would put between 9 - 12% of my salary in my pension
- I would put between 13 - 16% of my salary in my pension
- I would put between 17 - 20% of my salary in my pension
- I would put more than 20% of my salary in my pension

Q15 Some people are very proactive about their pension, others avoid thinking about it completely. How would you say you were?

Q16 When I hear about pensions my first instinct is....

- To think about it
- Not to think about it

Q17 When I hear about pensions it makes me....

- Want to do something about saving for my retirement
- Not want to do something about saving for my retirement

Q18 Now we want to ask you about the message you read earlier which was about saving for the future. What did you think about it?
(Measured on a scale of 1 – 7, where 1 = strongly disagree and 7 = strongly agree)

- The message I just read was overblown
- The message I just read on saving was exaggerated
- The message I just read was overstated
- The message I just read was manipulative
- The message I just read was misleading
- The message I just read was distorted

Q19 In the following questions we ask you to imagine that you have been job hunting and that you have been offered a number of jobs that come with different reward packages. We will then ask you to say how attractive you find these reward packages. Please imagine that everything else about the jobs is the same, the only difference is in their reward packages.

For your information: a *defined benefit* pension is the type of pension, common in the public sector, which pays out a secure retirement income for life which increases each year in line with inflation. The pension amount is based on how long you have worked for your employer, and the salary you have earned (for example it might be two thirds of your final salary).

In contrast, a *defined contribution* pension, common in the private sector, is where you and your employer contribute into a fund that is invested on your behalf. When you retire what you have to live on will depend on the value of this fund.

When you are ready, please click next.

Q20 Imagine that you have been offered two different jobs. You like them equally, the only difference between them is in the pay and pension. One has a *defined benefit* pension and one has a *defined contribution* pension. In both cases assume that you do not have to contribute anything to the pension in order to get the employer pension contribution. Please say how attractive you find these two reward packages compared to each other (where 0 is terrible and 100 is excellent).

- Salary of **£33,000** and a generous **defined benefit** pension
- Salary of **£45,000** and a **defined contribution** pension into which your employer will pay **3%** of your salary

Q22 Now imagine that you have been offered another three jobs. Again you like them equally and again the only difference between them is in the pay and pension they offer. This time they all come with the same type of pension - defined contribution. As before please assume that you do not have to contribute anything to the pension in order to get the employer contribution.
Please say how attractive you find these three reward packages compared to each other (where 0 is terrible and 100 is excellent).

- Salary of **£45,000** plus employer pension contributions of **3%** of salary
- Salary of **£42,000** plus employer pension contributions of **10%** of salary
- Salary of **£38,500** plus employer pension contributions of **20%** of salary

Q25 Finally imagine that you have been job hunting and that you have been offered a number of alternative jobs with varying financial packages. Again, imagine that you like the jobs equally, the only difference is in the pay and pension they offer. With this set of choices, the more that you put into your pension, the higher the total value of the financial package. However, this means you will have less money now. (Note the total cost to the employer of providing these financial packages is the figure at the end in brackets). If you had to choose one job package now, which one would you go for?

- Basic salary of **£37,500** plus an employer pension contribution of a further 30% (Total value: £48,750)
- Basic salary of **£38,250** plus an employer pension contribution of a further 25% (Total value: £47,813)
- Basic salary of **£39,000** plus an employer pension contribution of a further 20% (Total value: £46,800)

- Basic salary of **£39,750** plus an employer pension contribution of a further 15% (Total value: £45,713)
- Basic salary of **£40,500** plus an employer pension contribution of a further 10% (Total value: £44,550)
- Basic salary of **£41,250** plus an employer pension contribution of a further 5% (Total value: £43,313)
- Basic salary of **£42,000** plus no employer pension contribution (Total value: £42,000)

Q27 In this section we want to ask you a few questions about your feelings around saving for the future. We know it is a long way off, but please give your gut response.

Q28 Do you think you are at risk of not saving enough for retirement?
(measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)

- It is likely that I will not save enough for retirement
- I am at risk of not saving enough for retirement
- It is possible that I will not save enough for retirement

Q29 Do you think that a lack of saving for retirement is a serious problem?
(measured on a scale of 1 – 7, where 1 = strongly disagree and 7 = strongly agree)
I believe that under saving for retirement is serious problem
I believe that it would be very hard to rely on the state pension only in retirement
Please answer somewhat agree to this question
I believe that having no private savings for retirement would be a very bad idea.

Q30 Does the thought of not having enough money in retirement frighten you?
(measured on a scale of 1 – 7 where 1 = strongly disagree and 7 = strongly agree)

- I am frightened that I might not have enough to live on when I am older
- The thought of having to rely on the state pension in retirement is scary
- The thought that I might run out of money when I am older is frightening

Q32
Now we want to ask you a few questions about how in control you feel of your finances
(Measured on a scale of 1 = 7 where 1 = extremely difficult and 7 = extremely easy)

- How easy is it for you to save towards your pension?
- How easy would it be for you to increase your pension saving?
- How easy would it be for you to cut back on your day to day spending

Q33 To what extent do you agree with the following statements?
(Measured on a scale of 1 – 7, where 1 = strongly disagree and 7 = strongly agree)

- The tax relief given on pension saving make it good value for money
- In the long run investing in shares should return more than saving in cash
- In the long run saving in an occupational pension scheme will generate a good return on the money invested
- I trust my occupational pension fund to invest my money well

- The employer match means that saving in a pension is a good way to invest for the long term

Q34 Suppose you have a choice between the following options of how to spend the money you earn during your lifetime. Which option would you like most? (Please answer the question as if prices remained constant, i.e. if there was no inflation.) For clarity we have made a table here which summarises the six options

	Monthly spending during working life (age 25 until retirement)	Monthly spending during Retirement
Option A	£2,950	£1,900
Option B	£2,900	£2,200
Option C	£2,800	£2,500
Option D	£2,750	£2,750
Option E	£2,650	£3,200
Option F	£2,600	£3,600

Q35 Many people find financial choices confusing. So in this section we ask you a few questions to gauge how much you know about pensions and savings. Please don't look anything up, and if you don't know, please don't guess, please select 'Don't know'.

Q36 In general, from the employees' perspective, which is considered a better type of pension, defined benefit or defined contribution?

- Defined benefit
- Defined contribution
- Don't know
-

Q37 To encourage people to save for their retirement the government gives employees tax relief on their pension contributions. Do you know how much tax relief a basic rate taxpayer gets from the government on their pension contributions?

- 8%
- 12%
- 20%
- 40%
- Don't know

Q38 When you reach retirement and take the money out of your pension the government lets you take out a certain amount tax free. Do you know what percentage it is that you can withdraw tax free?

- 15%
- 25%
- 40%
- You can take it all tax free
- Don't know

Q39 Currently, roughly how much does the maximum Basic State Pension in the UK provide per week for a single person (in other words if you have no private pension savings how much will the UK state currently provide you to live on)?

- £128 per week
- £159 per week
- £189 per week
- £229 per week
- £249 per week

Q40 Finally, please answer a few questions about yourself.

Q56 What is your employment status?

- Full time
- Part time
- self employed
- other

Q41 Approximately how many years have you spent in paid work (do not count unpaid work or volunteering)?

- less than one year
- one to five years
- more than five years

Q42 How much money did you personally earn last year? Do not subtract the amount that you paid in taxes.

- 0 - £9,999
- £10,000 - £19,999
- £20,000 - £29,999
- £30,000 - £39,999
- £40,000 - £49,999
- more than £50,000

Q43 Imagine that there was a ladder that represented where people stand in our society. At the top of the ladder are the people who are the best off, those who have the most money, most education, and best jobs. At the bottom are the people who are the worst off, those who have the least money, least education, and worst jobs or no job. Please mark below where you think best represents where you stand on that ladder
(measured on a scale of 1 – 10, where 1 = top of the ladder, i.e. the most money, most education, the best jobs) and 10 = Bottom of the ladder, i.e. the least money, least education, the worst or no jobs.

Q44 How stable do you feel that your income flow will be in your future career?
(measured on a scale of 1 – 5, where 1 = very unstable and 5 = very stable)

Q45 Are you currently saving in an occupational pension? (Yes/ No/ I don't know)

Q46 Do you know if you have a defined benefit or a defined contribution pension?

- I have a defined benefit pension
- I have a defined contribution pension
- I don't know

Q47 Do you know what percentage of your salary your employer contributes to your pension? (Yes/ No)

Q48 Do you know what percentage of your salary you contribute to your pension? (Yes/ No)

Q49 How likely are you to increase your saving in a pension in the next year?
(Measured on a scale of 1 – 7, where 1 = extremely unlikely and 7 = extremely likely)

Q50 How likely are you to start saving in a pension in the next year?
(Measured on a scale of 1 – 7, where 1 = extremely unlikely and 7 = extremely likely)

Q51 How old are you?

Q52 What is your gender?

- Male
- Female
- I prefer not to say

Q54 The End. Thank you very much for your participation. If you would like to receive some follow up information tick the option below.

- Yes, I would like some follow up information
- No, I would not like any follow up information

Q55 Comments (optional, but we would welcome any feedback you had on this survey)

Appendix D.2 Details of pay data used to inform job choice questions

For Experiment 3:

https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/agegroupashetable6

In 2016 pay data for those aged 30-39:

Male: median full-time earnings for men were: £30,978.
This ranged from £17,724 at the 10th percentile, to £45,677 at 80th percentile and £58,528 at the 90th percentile

Female: median full-time earnings for women were: £27,441
This ranged from £15,010 at the 10th percentile, to £40,000 at the 80th percentile, and £48,911 at the 90th percentile

In experiment 2 I had set the total cost to the employer of the job packages at 93% of male earnings at the 90th percentile.

Using the same calculation in this experiment with the older demographic would have resulted in a total cost to the employer of around £54,000.

I was concerned that this would be too high, so decided to use £46,350 as a max total cost to employer which is closer to the 80th percentile of male full-time earnings for ages 30 – 39.

Consequently, in Q20, the option is either £33,000 plus generous DB pension (total cost to employer is 33,000 plus pension cost of 40% = £46,200) or £45,000 plus pension of 3% (total cost to employer is £45,000 plus 0.03% = £46,350.

Appendix D.3 Paired samples t-test comparing different DC pensions where there is a trade-off between better pay now or a better pension later

Table D.4.1 *Results of t-test and Descriptive Statistics for attractiveness of job package (DC pensions)*

	Low pay/high pension (Q24)		High pay/low pension (Q22)			95% CI for Mean Difference		
Outcome	*M*	*SD*	*M*	*SD*	n		*t*	*df*
	72.63	21.84	60.77	19.86	417	(9.02) – (14.69)	8.21	416

* $p < .001$.

Note: attractiveness is scored from 0 – 100

Note a: the correlation. This tells you the degree to which a participant's scores on the first variable are similar, in terms of ranking, with their scores on the second variable (for example if you score low on the first variable, you will also score low in the second) even though there may be trend on average for an increase or decrease. The correlation here is very low, which is a cause for concern.

Appendix D.4 Mediation output: Expectancy, instrumentality and valence

Mediation output Expectancy

Note: This output shows the statistical results for the test of Expectancy (EXPSCALE) as a mediator (M) of the impact that the educational nudge (X) had on attitudes to pensions (Y). The results were null, which is why they have not been reported in the main text.

The educational nudge had four categories (participants were randomised to see a fear message, a positive affect message, an emotionally neutral message or were put into a control group and saw no message). As normal when using regression with multi categorical predictor variables, dummy variables were created so that X1 = the fear message, X2 = the positive affect message X3= the emotionally neutral message with the control group as the reference category.

See the notes below in each section, for interpretation.

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.00 *****************

          Written by Andrew F.  Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2018).  www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : ATTPENS
    X  : CONDNUM
    M  : EXPSCALE

Sample
Size:  417

Coding of categorical X variable for analysis:
 CONDNUM      X1      X2      X3
   1.000    .000    .000    .000
   2.000   1.000    .000    .000
   3.000    .000   1.000    .000
   4.000    .000    .000   1.000

**************************************************************************
OUTCOME VARIABLE:
 EXPSCALE
```

Note: The results below report the results of the impact of the educational nudge on Expectancy. This is path *'a'* in the statistical model figure 7-2 in chapter 7.

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .0393      .0015    20.7754      .2131     3.0000   413.0000      .8873

Model
              coeff         se          t          p       LLCI       ULCI
constant    10.6449      .4406    24.1578      .0000     9.7787    11.5110
X1           -.4428      .6356     -.6967      .4864    -1.6923      .8066
X2           -.3996      .6246     -.6397      .5227    -1.6274      .8283
X3           -.1782      .6261     -.2846      .7761    -1.4090     1.0526

**************************************************************************
OUTCOME VARIABLE:
 ATTPENS
```

Note: The results below report the results of the impact of the educational nudge on attitudes to pensions when including Expectancy in the model.
These are paths: *C'₁ C'₂ and C'₃* and *b'* in the statistical model figure 7-2 in chapter 7.

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .3115      .0970    12.2947    11.0673     4.0000   412.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant    14.3040      .5266    27.1647      .0000    13.2689    15.3391
X1            .2065      .4893      .4220      .6732     -.7553     1.1682
X2           -.0528      .4808     -.1099      .9126     -.9979      .8922
X3           1.4760      .4817     3.0642      .0023      .5291     2.4229
EXPSCALE      .2094      .0379     5.5309      .0000      .1350      .2838

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 ATTPENS
```

Note: The results below report the results of the relative total effect of X on attitudes to pensions. In other words, they are the sum of the direct and indirect effect of each X on attitudes to pensions ($C_j = C'_j + a_jb$ *where* C_j *= the total effect,* C'_j *the direct effect and* a_jb *the indirect effect).*

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1731      .0300    13.1756     4.2545     3.0000   413.0000      .0056

Model
              coeff         se          t          p       LLCI       ULCI
constant    16.5327      .3509    47.1140      .0000    15.8429    17.2225
X1            .1138      .5062      .2247      .8223     -.8813     1.1088
X2           -.1365      .4974     -.2744      .7839    -1.1143      .8413
X3           1.4387      .4986     2.8854      .0041      .4586     2.4189

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Relative total effects of X on Y:
       Effect         se          t          p       LLCI       ULCI
X1      .1138      .5062      .2247      .8223     -.8813     1.1088
X2     -.1365      .4974     -.2744      .7839    -1.1143      .8413
X3     1.4387      .4986     2.8854      .0041      .4586     2.4189

Omnibus test of total effect of X on Y:
    R2-chng          F        df1        df2          p
      .0300     4.2545     3.0000   413.0000      .0056
----------
```

Note: here the total effect is partitioned into the relative direct effect – i.e. pathway C' **and the indirect effect (**a_jb**)**

```
Relative direct effects of X on Y
       Effect         se          t          p       LLCI       ULCI
X1      .2065      .4893      .4220      .6732     -.7553     1.1682
X2     -.0528      .4808     -.1099      .9126     -.9979      .8922
X3     1.4760      .4817     3.0642      .0023      .5291     2.4229

Omnibus test of direct effect of X on Y:
    R2-chng          F        df1        df2          p
      .0293     4.4492     3.0000   412.0000      .0043
----------

Relative indirect effects of X on Y
```

Note: this relative indirect effect of X on Y is calculated as the product of a_jb**. This indirect effect is the test of mediation. As the sampling distribution of two regression coefficients is not normal, 95% bootstrap confidence intervals are used to test the effect. Given that the confidence intervals for the relative indirect effect of each X category on attitudes to pension (Y)contains zero, we conclude that there is no evidence to support the hypothesis that EXPSCALE mediates the relationship between the educational nudge and attitudes to pensions.**

```
 CONDNUM     ->    EXPSCALE    ->    ATTPENS

       Effect     BootSE   BootLLCI   BootULCI
X1     -.0927      .1411     -.3814      .1824
X2     -.0837      .1342     -.3683      .1648
X3     -.0373      .1284     -.2894      .2200

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Mediation output Instrumentality

Note: This output shows the statistical results for the test of Instrumentality (INSTSCLE) as a mediator (M) of the impact that the educational nudge (X) had on attitudes to pensions (Y). The results were null, which is why they have not been reported in the main text.

The educational nudge had four categories (participants were randomised to see a fear message, a positive affect message, an emotionally neutral message or were put into a control group and saw no message). As normal when using regression with multi categorical predictor variables, dummy variables were created so that X1 = the fear message, X2 = the positive affect message X3= the emotionally neutral message with the control group as the reference category.

See the notes below in each section, for interpretation.

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.00 *****************

          Written by Andrew F.  Hayes, Ph.D.        www.afhayes.com
    Documentation available in Hayes (2018).  www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : ATTPENS
    X  : CONDNUM
    M  : INSTSCLE

Sample
Size:  417

Coding of categorical X variable for analysis:
 CONDNUM      X1      X2      X3
   1.000    .000    .000    .000
   2.000   1.000    .000    .000
   3.000    .000   1.000    .000
   4.000    .000    .000   1.000

**************************************************************************
OUTCOME VARIABLE:
 INSTSCLE
Note: The results below report the results of the impact of the educational nudge
on INSTSCLE. This is path 'a' in the statistical model figure 7-2 in chapter 7.
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .0985      .0097    19.8493     1.3474     3.0000   413.0000      .2585

Model
```

	coeff	se	t	p	LLCI	ULCI
constant	24.9346	.4307	57.8923	.0000	24.0879	25.7812
X1	-.9144	.6213	-1.4717	.1419	-2.1357	.3069
X2	-.6893	.6105	-1.1290	.2596	-1.8895	.5109
X3	.1226	.6120	.2003	.8414	-1.0805	1.3256

```
**************************************************************************
OUTCOME VARIABLE:
 ATTPENS
```

Note: The results below report the results of the impact of the educational nudge on attitudes to pensions when including instrumentality in the model.
These are paths: *C′₁ C′₂ and C′₃* and *b′* in the statistical model figure 7-2 in chapter 7.

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5455	.2976	9.5634	43.6448	4.0000	412.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	5.8618	.9026	6.4943	.0000	4.0875	7.6360
X1	.5051	.4324	1.1681	.2434	-.3449	1.3550
X2	.1585	.4244	.3734	.7090	-.6758	.9929
X3	1.3863	.4248	3.2632	.0012	.5512	2.2214
INSTSCLE	.4280	.0342	12.5298	.0000	.3608	.4951

```
************************* TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 ATTPENS
```

Note: The results below report the results of the relative total effect of X on attitudes to pensions. In other words, they are the sum of the direct and indirect effect of each X on attitudes to pensions (*$C_j = C'_j + a_jb$ where C_j = the total effect, C'_j the direct effect and a_jb the indirect effect)*.

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1731	.0300	13.1756	4.2545	3.0000	413.0000	.0056

Model

	coeff	se	t	p	LLCI	ULCI
constant	16.5327	.3509	47.1140	.0000	15.8429	17.2225
X1	.1138	.5062	.2247	.8223	-.8813	1.1088
X2	-.1365	.4974	-.2744	.7839	-1.1143	.8413
X3	1.4387	.4986	2.8854	.0041	.4586	2.4189

```
************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************
```

Relative total effects of X on Y:

	Effect	se	t	p	LLCI	ULCI
X1	.1138	.5062	.2247	.8223	-.8813	1.1088
X2	-.1365	.4974	-.2744	.7839	-1.1143	.8413
X3	1.4387	.4986	2.8854	.0041	.4586	2.4189

Omnibus test of total effect of X on Y:

R2-chng	F	df1	df2	p
.0300	4.2545	3.0000	413.0000	.0056

```
----------
```

Note: here the total effect is partitioned into the relative direct effect – i.e. pathway *C′* and the indirect effect (*a_jb*)

Relative direct effects of X on Y

	Effect	se	t	p	LLCI	ULCI
X1	.5051	.4324	1.1681	.2434	-.3449	1.3550
X2	.1585	.4244	.3734	.7090	-.6758	.9929
X3	1.3863	.4248	3.2632	.0012	.5512	2.2214

Omnibus test of direct effect of X on Y:

```
    R2-chng          F        df1        df2          p
      .0216     4.2309     3.0000   412.0000      .0058
----------

Relative indirect effects of X on Y
Note: this is calculated as the product of ajb. This indirect effect is the test
of mediation. As the sampling distribution of two regression coefficients is not
normal, 95% bootstrap confidence intervals are used to test the effect. Given
that the confidence intervals for the relative indirect effect of each X category
on attitudes to pension (Y)contains zero, we conclude that there is no evidence
to support the hypothesis that instrumentality mediates the relationship between
the educational nudge and attitudes to pensions.

 CONDNUM     ->    INSTSCLE    ->    ATTPENS

       Effect     BootSE   BootLLCI   BootULCI
X1     -.3913      .2542     -.8725      .1143
X2     -.2950      .2725     -.8251      .2386
X3      .0525      .2517     -.4288      .5589

********************** ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Mediation output Valence

Note: This output shows the statistical results for the test of valence as a mediator (M) of the impact that the educational nudge (X) had on attitudes to pensions (Y). The results were null, which is why they have not been reported in the main text.

The educational nudge had four categories (participants were randomised to see a fear message, a positive affect message, an emotionally neutral message or were put into a control group and saw no message). As normal when using regression with multi categorical predictor variables, dummy variables were created so that X1 = the fear message, X2 = the positive affect message X3= the emotionally neutral message with the control group as the reference category.

See the notes below in each section, for interpretation.

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.00 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : ATTPENS
    X  : CONDNUM
    M  : VALNCE

Sample
Size:  417

Coding of categorical X variable for analysis:
 CONDNUM      X1      X2      X3
   1.000    .000    .000    .000
   2.000   1.000    .000    .000
```

```
   3.000    .000   1.000    .000
   4.000    .000    .000   1.000

************************************************************************
OUTCOME VARIABLE:
 VALNCE
```

Note: The results below report the results of the impact of the educational nudge on valence. This is path '*a*'in the statistical model figure 7-2 in chapter 7.

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .0941      .0089     2.0541     1.2305     3.0000   413.0000      .2982

Model
              coeff         se          t          p       LLCI       ULCI
constant     3.4206      .1386    24.6877      .0000     3.1482     3.6929
X1            .2865      .1999     1.4335      .1525     -.1064      .6794
X2            .3342      .1964     1.7014      .0896     -.0519      .7202
X3            .1128      .1969      .5728      .5671     -.2742      .4998

************************************************************************
OUTCOME VARIABLE:
 ATTPENS
```

Note: The results below report the results of the impact of the educational nudge on attitudes to pensions when including valence in the model.
These are paths: *C′₁ C′₂ and C′₃* and *b′* in the statistical model figure 7-2 in chapter 7.

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1732      .0300    13.2072     3.1867     4.0000   412.0000      .0135

Model
              coeff         se          t          p       LLCI       ULCI
constant    16.5824      .5528    29.9973      .0000    15.4957    17.6691
X1            .1179      .5081      .2321      .8166     -.8808     1.1166
X2           -.1316      .4998     -.2634      .7924    -1.1140      .8508
X3           1.4404      .4994     2.8841      .0041      .4586     2.4221
VALNCE       -.0145      .1248     -.1164      .9074     -.2598      .2307

************************* TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 ATTPENS
```

Note: The results below report the results of the relative total effect of X on attitudes to pensions. In other words, they are the sum of the direct and indirect effect of each X on attitudes to pensions (*$C_j = C'_j + a_jb$ where C_j = the total effect, C'_j the direct effect and a_jb the indirect effect)*.

```
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .1731      .0300    13.1756     4.2545     3.0000   413.0000      .0056

Model
              coeff         se          t          p       LLCI       ULCI
constant    16.5327      .3509    47.1140      .0000    15.8429    17.2225
X1            .1138      .5062      .2247      .8223     -.8813     1.1088
X2           -.1365      .4974     -.2744      .7839    -1.1143      .8413
X3           1.4387      .4986     2.8854      .0041      .4586     2.4189

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Relative total effects of X on Y:
       Effect         se          t          p       LLCI       ULCI
X1      .1138      .5062      .2247      .8223     -.8813     1.1088
X2     -.1365      .4974     -.2744      .7839    -1.1143      .8413
X3     1.4387      .4986     2.8854      .0041      .4586     2.4189

Omnibus test of total effect of X on Y:
```

```
    R2-chng          F        df1        df2          p
      .0300     4.2545     3.0000   413.0000      .0056
----------
```

Note: here the total effect is partitioned into the relative direct effect – i.e. pathway *C′* and the indirect effect ($a_j b$)

```
Relative direct effects of X on Y
       Effect         se          t          p       LLCI       ULCI
X1      .1179      .5081      .2321      .8166     -.8808     1.1166
X2     -.1316      .4998     -.2634      .7924    -1.1140      .8508
X3     1.4404      .4994     2.8841      .0041      .4586     2.4221

Omnibus test of direct effect of X on Y:
    R2-chng          F        df1        df2          p
      .0299     4.2323     3.0000   412.0000      .0058
----------
```

Relative indirect effects of X on Y

Note: this is calculated as the product of $a_j b$. This indirect effect is the test of mediation. As the sampling distribution of two regression coefficients is not normal, 95% bootstrap confidence intervals are used to test the effect. Given that the confidence intervals for the relative indirect effect of each X category on attitudes to pension (Y)contains zero, we conclude that there is no evidence to support the hypothesis that valence mediates the relationship between the educational nudge and attitudes to pensions.

```
 CONDNUM     ->    VALNCE      ->    ATTPENS

       Effect     BootSE   BootLLCI   BootULCI
X1     -.0042      .0439     -.1084      .0783
X2     -.0049      .0473     -.1059      .0964
X3     -.0016      .0285     -.0646      .0608

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Appendix D.5 Moderation output: Fear

```
Note that moderation was carried out following the instructions in my 'SPSS how
to' notes following Hayes.

Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.3 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com

**************************************************************************
Model = 1
    Y = ATTPENS
    X = CONDNUM
    M = FEARIND

Sample size
        417

Coding of categorical X variable for analysis:
 CONDNUM      D1      D2      D3
    1.00     .00     .00     .00
    2.00    1.00     .00     .00
    3.00     .00    1.00     .00
    4.00     .00     .00    1.00

**************************************************************************
Outcome: ATTPENS

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2094      .0438    13.1145     4.0121     7.0000   409.0000      .0003

Model
              coeff         se          t          p       LLCI       ULCI
constant    16.5411      .4078    40.5605      .0000    15.7394    17.3428
FEARIND       .1706      .1727      .9881      .3237     -.1688      .5101
D1            .1134      .5663      .2002      .8414     -.9998     1.2265
D2           -.1310      .5303     -.2470      .8051    -1.1735      .9115
D3           1.4702      .4911     2.9937      .0029      .5048     2.4355
int_1        -.1214      .2044     -.5941      .5528     -.5232      .2803
int_2        -.0067      .2086     -.0320      .9745     -.4167      .4034
int_3        -.3086      .1899    -1.6253      .1049     -.6819      .0647

Product terms key:
 int_1     :       D1        X       FEARIND
 int_2     :       D2        X       FEARIND
 int_3     :       D3        X       FEARIND

R-square increase due to interaction:
    R2-chng          F        df1        df2          p
      .0107     2.0647     3.0000   409.0000      .1043

**************************************************************************

Conditional effect of X on Y at values of the moderator:

Moderator value:
FEARIND    -3.1573

        Coeff         se          t          p       LLCI       ULCI
D1       .4967      .8721      .5696      .5693    -1.2177     2.2111
D2      -.1099      .8515     -.1291      .8974    -1.7837     1.5639
D3      2.4446      .7534     3.2449      .0013      .9637     3.9256

Test of equality of conditional means at this value of the moderator
```

```
    R2-chng          F        df1        df2          p
      .0355     8.7023     3.0000   409.0000      .0000

Estimated conditional means at this value of the moderator
    CONDNUM       yhat
     1.0000    16.0023
     2.0000    16.4990
     3.0000    15.8924
     4.0000    18.4469
------------
Moderator value:
FEARIND      .0000

        Coeff         se          t          p       LLCI       ULCI
D1      .1134      .5663      .2002      .8414     -.9998     1.2265
D2     -.1310      .5303     -.2470      .8051    -1.1735      .9115
D3     1.4702      .4911     2.9937      .0029      .5048     2.4355

Test of equality of conditional means at this value of the moderator
    R2-chng          F        df1        df2          p
      .0309     6.1329     3.0000   409.0000      .0004

Estimated conditional means at this value of the moderator
    CONDNUM       yhat
     1.0000    16.5411
     2.0000    16.6545
     3.0000    16.4101
     4.0000    18.0112
------------
Moderator value:
FEARIND     3.1573

        Coeff         se          t          p       LLCI       ULCI
D1     -.2700      .8446     -.3197      .7494    -1.9303     1.3903
D2     -.1520      .8396     -.1811      .8564    -1.8026     1.4985
D3      .4957      .7961      .6227      .5338    -1.0692     2.0606

Test of equality of conditional means at this value of the moderator
    R2-chng          F        df1        df2          p
      .0032      .5791     3.0000   409.0000      .6290

Estimated conditional means at this value of the moderator
    CONDNUM       yhat
     1.0000    17.0798
     2.0000    16.8099
     3.0000    16.9278
     4.0000    17.5756

Moderator values are the sample mean and plus/minus one SD from mean

**************************************************************************

Data for visualizing conditional effect of X on Y
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/CONDNUM FEARIND ATTPENS.
BEGIN DATA.

     1.0000    -3.1573    16.0023
     2.0000    -3.1573    16.4990
     3.0000    -3.1573    15.8924
     4.0000    -3.1573    18.4469
     1.0000      .0000    16.5411
     2.0000      .0000    16.6545
     3.0000      .0000    16.4101
     4.0000      .0000    18.0112
     1.0000     3.1573    17.0798
     2.0000     3.1573    16.8099
```

```
     3.0000     3.1573    16.9278
     4.0000     3.1573    17.5756

END DATA.
GRAPH/SCATTERPLOT=FEARIND WITH ATTPENS BY CONDNUM.

****************** ANALYSIS NOTES AND WARNINGS *************************

Level of confidence for all confidence intervals in output:
    95.00

NOTE: The following variables were mean centered prior to analysis:
 FEARIND

NOTE: Johnson-Neyman method not available with multicategorical X

NOTE: All standard errors for continuous outcome models are based on the HC3
estimator

------ END MATRIX -----
```

Appendix E Glossary

Adequacy: Pension adequacy is often measured by a calculation of an individual pensioners' benefit relative to his or her previous wage. This will give a measure of income smoothing. See **replacement rate** below for details. The calculation of average pension benefit as a % of average wage will give measures the poverty relief aspect.

Affluence test: A measure of eligibility of benefits that is designed to screen out only the best off (see also an **income test** and **means test**).

Annuity: An annuity is a financial product that allows you to buy, for a fixed lump sum, a regular income that will last you the rest of your life. For example, if you have £100,000 in retirement savings and are offered an annuity rate of 6% this will buy an income of £6,000 every year until you die. They are an insurance product, and there are many different types. For example, some allow for an income for a dependent, or some escalate with inflation. The most common kind bought is fixed rate, with no indexing for inflation, as this is significantly cheaper. If you purchase an annuity at the age of 65 and die six months later all the money spent on the annuity is unrecoverable, annuities are like insurance, and those who die early subsidise those who die later.

Automatic enrolment: A pension scheme where an individual is made a member by default and has to actively decide to leave.

Basic State Pension (BSP): A state pension based not on earnings but on an individual's years of **National Insurance** contributions. As of 2018 you have to have a total of 30 qualifying years of National Insurance contributions or credits. You may get National Insurance credits if, for example, you were registered as unemployed or ill, or if you are caring for a child or dependent.

Career Average Pensions: 'Career Average Revalued Earnings' (CARE) schemes are a type of defined benefit pension. A CARE scheme, in contrast to a **final salary** scheme, bases the pension paid on average earnings, after adjusting these average earnings for inflation. They typically cost less to run (as average earnings are typically lower than final

earnings). It is argued that career average schemes are fairer in that they better reflect earnings and contributions made through an entire career. In contrast, in final salary schemes, those members whose salary increases fastest during their careers get a better return from the scheme.

Consumer Prices Index (CPI): This is a measure of inflation, based on the change in prices of a typical basket of goods and services. The CPI excludes housing costs. In contrast the **Retail Price Index (RPI)** takes account of housing costs. The CPI is a more recent measure than RPI and is normally about 1% lower than RPI.

Deficits: When the **liabilities** of a pension scheme are in excess of the assets of the pension fund the pension is said to be in deficit. A scheme is described as 'fully funded", "in surplus" or "in deficit" depending on the value of assets held by the scheme compared to the value of its liabilities. When establishing the funding position of a pension scheme the value of the assets invested in today, and the return those assets are likely to deliver, are used to calculate whether the scheme will be in a position of pay future liabilities at a time that they fall due.

Defined Benefit (DB) Pension: A pension scheme where the pension paid out is calculated in relation to the members' salary or some other value that is fixed in advance.

Defined Contribution (DC) Pension: A pension where contributions are made into a fund that is invested. On retirement the pension income will depend on how much has been paid in, the investment returns, the charges made. This leaves most of the risk with the individual.

Earnings Trigger: Under **auto enrolment** legislation employers are required to enrol employees into a pension, and make pension contributions on their behalf, once earnings hit a certain level called the 'earnings trigger'. In other words the earnings trigger sets the point at which someone becomes eligible to be automatically enrolled into a work place pension. Currently it is set at £10,000 a year.

Final salary pension: This is a type of **defined benefit** pension, where the pension that is paid out is calculated according to the number of years' service, the accrual rate, and the final salary in the year (or last few years) before retirement.

Funded: Pension schemes in which pension contributions are paid into a fund which is invested and then pensions are paid out of this pot.

Graduated retirement pension: This was a **National Insurance** pension scheme (offered by the UK state) which ran from 1961 – 1975. It provided earnings – related benefits based on contributions. For more details see appendix F of the Turner Report (2004).

Implicit tax rate: This is a 'tax' that arises when a household, in receipt of an income-tested benefit, earns income and as a consequence loses that benefit. For example, if the benefit is reduced pound for pound as a consequence of earnings, then the implicit tax rate is 100%.

Income test: A way of determining eligibility for benefits that targets only individuals and families on low incomes (as opposed to being based also on the value of assets).

Individual Savings Accounts (ISA): This is a tax favoured savings account. In 2018/19 individuals are allowed to save a maximum of £20,000 a year into an ISA (which can be invested in stocks and shares or cash) and this is free of tax on dividends, interest and capital gains.

Liabilities: The liabilities of a **Defined Benefit** pension scheme are essentially the value of the promises made to pay each members' retirement benefits. These promises are normally based on: the individual's salary, the number of years that the individual has been a member of the scheme and the accrual rate applied to the scheme. Valuing these liabilities is a complex calculation as there are a large number of unknown factors. See "Defined Benefits: valuing and managing liabilities" (2017) for a fuller account of the details of how liabilities are calculated.

Lifetime ISA (LISA): Introduced in 2017 the LISA is a tax favoured savings account which can be opened by anyone aged between 18 and 39. Once open you can continue to

save in the LISA until you hit 50. It allows you to save up to £4,000 a year out of (after tax) income. The state will then add a 25% bonus on top each year until you hit 50. It was designed for two purposes: First to help first time buyers: you are allowed to withdraw your LISA savings to buy a first time residential property to live in that costs £450,000 or less. Second you can you use it for retirement savings when you are allowed to withdraw the money at 60. Early withdrawals for other reasons are allowed with a penalty of 25%. If taken to buy a first property or at aged 60 there is no tax to pay.

Means-tested benefits: State benefits where the amount paid depends on the level of income and capital and other personal circumstance.

Minimum Income Guarantee (MIG): This was introduced in 1999 as a **means-tested benefit** designed to help pensioner poverty. It was the forerunner of the **Guarantee Credit** (see **Pension Credit**)

National Insurance: UK system of social insurance (tax) intended to pay for unemployment, ill-health and retirement benefits.

Notional defined contribution (NDC): NDC pension plans differ in detail, however the basic principle is that they mimic **defined contribution** pension schemes but are funded on a '**Pay As You Go' (PAYG)** basis. Here the contributions made to one's pension are recorded (but not in reality set aside and invested in assets) and the notional balance will earn a rate of return that is determined by the scheme. A key feature of an NDC system is that, in contrast to typical PAYG schemes, there is an actuarial relationship between an individual's contributions and what he/she ultimately receives.

Occupational pension scheme: Occupational pension schemes, or company pension schemes, are pensions set up by an employer to provide pensions for their employees. Occupation pensions can be of many different types, for example **Defined Benefit**, or **Defined Contribution**. They are distinct from state pensions (i.e. pensions that are paid by the state to its citizens) and private pensions (that can be set up privately by individuals).

Pay As You Go (PAYG): Usually run by the state a PAYG (or **unfunded**) pension is where pensions are paid out of current revenue and no funds are accumulated or put aside to pay future pensions. They are essentially contracts between generations. The working population pays the pensions of the retired in expectation that when they retire the younger generation will in turn pay their pension.

Pension Credit: this was a **means-tested benefit** for pensioners introduced in 2003 and was made up of two parts: The Guarantee Credit (PCGC); and the Savings Credit (PCSC). The Guarantee Credit topped up people's incomes to a particular level (£105.45 per week for a single person in 2004/5) with a pound for pound withdrawal rate (or **implicit tax**) for any pre-benefit income. The Savings Credit was an additional means-tested benefit relating to income above the level of the basic state pension. Its value was calculated so that the effective withdrawal rate of the Pension Credit (Guaranteed Credit and Savings Credit) was 40% if pre-benefit income was above the BSP (while withdrawing 100% if income was below the level of the BSP) (Turner et al., 2004). This system was seen as over complex and one factor that reduced the incentive to save privately for some people.

Poverty: Relative poverty (in contrast to absolute poverty) measures the extent to which individuals or households fall below some % of median income. For example the European Commission uses a relative poverty line of 60% of national median income. Absolute poverty is the extent to which individuals or households can afford the basic needs of life. See Barr (2004) for a discussion of why conventional definitions of poverty and inequality, based on money income only, are severely limited as measures of welfare.

Qualifying Earnings: Under **auto enrolment** legislation employers are required to enrol employees into a pension and make pension contributions on **'qualifying earnings'**. As of the year 2017/208 'qualifying earnings' are set at a lower limit of £5,876 and upper limit of £45,000, and so employer and employee pension contributions are made on earnings between these two limits. These are minimum contribution levels, and they are reviewed each year.

Replacement rate: This measures income in retirement as a proportion of income before retirement. It is one measure of the '**adequacy**' of pension income. The Pensions

Commission report of 2004 assumed the following rates as benchmarks for their modelling:

Pre-retirement gross earnings:	Replacement rate:
Less than £9,500	80%
£9,500 - £17,499	70%
£17,500 – 24,999	67%
£25,000 – 50,000	60%
£50,000 and more	50%

So, for Pre-retirement gross earnings of less than £9,500, the report suggested that a replacement rate of 80% would be one target for pension adequacy.

Retail Prices Index (RPI): This is a measure of the change in the prices of goods and services bought for consumption by the vast majority of households in the UK (see also **CPI**).

State Earnings Related Pension Scheme (SERPS): This was the forerunner of the **State Second Pension**, which provided an earnings-related pension based on contributions. It was introduced in 1978 and provided a pension related to earnings in addition to the **basic state pension (BSP)**.

State Second Pension (S2P): This was introduced in 2002 by the Labour Government to replace SERPS. The main intention of this change was to skew pension benefits in favour of low and moderate earners at the expense of higher earners.

Support ratio: The old age support ratio measures how many people there are of working age (20 – 64) relative to the number of people of retirement age (65+). OECD countries have been aging for some time and between 1950 and 1980 the support ratio decreased from 7.2 to 5.1 and this population aging is expected to accelerate ("Old-Age Support Ratio," 2011). Note that Mullen (2000) argues that the old age support ratio is a crude arithmetic relationship that obscures the more fundamental determinant of societies ability to provide an adequate standard of living for all its members, whatever their age, namely a countries productivity.

Triple lock: The state pension 'triple lock" was a promise made by the Conservative-Liberal Democrat coalition government in 2010 which guaranteed to increase the state pension every year by the higher of: inflation, average earnings or a minimum of 2.5%.

Unfunded: An unfunded (or **PAYG**) pension is when a pension scheme is not backed by any fund. Instead current pension contributions (and employer contributions) are used to pay current pensions.