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Decision Making in the Pension Fund Board Room:
An Experiment with Dutch Pension Fund Trustees

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Abstract

We ask how pension fund trustees deal with the booms and busts that funds encounter, and to what extent the decisions of pension fund trustees are affected by behavioral biases. We examine these issues by using a vignette-method field experiment among Dutch pension fund trustees. We find that trustees display choices that accord with the phenomenon of loss aversion and that trustees allow their choices to be affected by the forces of social comparison: the reserve position of their fund compared to the position of other funds has a significant influence in choosing a pension fund policy mix.

1. Introduction

Pension funds worldwide are facing hard times: having lost, between January and October 2008, about US$3.3 trillion, or nearly 20 per cent of the value of their accumulated assets (OECD, 2008). Despite the stock market crash, the importance of pension funds in many advanced countries is large, and funds are essential to the functioning of the country's financial system. The credit crunch has been a wake-up call for pension funds on the sustainability of pension contracts and has also moved the question of the governance of pension funds to center stage. In spite of its dominant role in the financial systems and importance for the financial well-being of millions of pensioners worldwide, knowledge about how pension funds make decisions often only touches the surface, interpreting realized investment decisions of funds as the revealed preferences of rational and fully informed decision-makers (De Bondt and Thaler, 1995). This picture seems at odds with the day-to-day reality of stakeholders in the pension fund industry, who generally contract out asset management and pension administration, and for whom full information is more a fund manager's dream than a reality. Risk, uncertainty, and information asymmetries abound and the complexity of goals and objectives are hard to grasp, even for insiders, and links with the real and financial markets are difficult to assess. In this world, pension fund trustees – members appointed by employers and employees who are entrusted with matching assets and liabilities – must cope with the realities of the markets and make decisions.

Examining the economic decisions of pension fund trustees is relevant to participants and regulators. Trustees control enormous financial resources. By the end of 2007, OECD pension funds assets reached the amount of US$17.7 trillion, which represents 64 per cent of the total assets in private pension arrangements (OECD, 2008). How the trustees of pension savings allocate the resources has a profound effect on the economic growth and societal welfare (Davis and Hu, 2007; Clark, 1998); an increasing number of pensioners draw their income from accumulated pension rights managed by these trustees, and, given the prospect of ageing societies, the role of trustees is steadily gaining in influence.

Studies on governance usually focus on the design of boards, but the behavioral aspects of pension fund design, trustees' decision-making abilities, characteristics, and

effectiveness are less well researched. Clark et al. (2006, 2007) survey the decision-making ability of pension fund trustees in the UK, showing that British pension fund trustees lack common approaches relevant to investment decisions and are inconsistent in dealing with problems involving probability judgment. Clark et al. (2006) show that trustees are more cautious with other peoples' money than they are with their own. The fact that trustees are not professionals has also led to concerns that trustees may lack the understanding to judge the advice they receive from finance experts. Clark et al. (2007), using UK pension fund governance and the U.S. mutual fund industries as examples, note a growing tension between representation and expertise in several fields. The evidence presented by them suggests that very few trustees have the competence and consistent judgment to challenge the experts who are responsible for executing complex financial decisions. These findings raise the question of how pension fund trustees do make decisions on the management of the pension fund.

In this paper we build on the behavioral finance literature and focus on the decisions of pension fund trustees in the Netherlands. To discover how pension fund trustees make decisions and make trade-offs under demographic and economic uncertainty we have designed an experiment that uses the vignette method, also known in some disciplines as factorial surveys or conjoint analysis. In a vignette study, participants are presented with vignettes, short descriptions with specific information randomly manipulated by the researcher (Van Beek et al., 1997; Ganong and Coleman, 2006; Kapteyn et al., 2007; Wallander, 2009).

We mimic the dilemmas of the pension fund boardroom and distill the choices that board members take in good and bad times. Thus, our paper may offer new insights not only on how investment choices are made, but also on how trustees take into account demographic and economic risks in pension fund policy. We ask what factors matter in decision making for Dutch pension fund trustees. Trustees make complex decisions, balancing the interests of participants, sponsors, and regulators, and these decisions usually take the shape of financial trade-offs. To add to the complexity, these trade-offs are both *intra*generational and *inter*generational (Barr and Diamond, 2006).

We analyze how pension fund trustees make trade-offs, and what these trade-offs are in the face of demographic, financial and economic shocks. We find that pension fund

trustees are just as likely as ordinary people to display behavioral biases. Trustees are more apt to act in bad times to prevent losses than they are in good times in which the status quo prevails. This is consistent with the loss aversion phenomenon. Furthermore, we find that trustees of both large and small pension funds allow their choices to be affected by comparing the reserve position of their fund to the position of other funds. This social comparison has a significant influence in trustees' choices of a pension fund policy mix.

The remainder of this paper is structured as follows. In Section 2 we review the background of the Dutch pension system, and the governance structure of Dutch pension funds. Section 3 discusses the data we use, and explains our estimation methodology. Section 4 presents the empirical results and Section 5 concludes.

2. Background on Dutch pension system

Here, we briefly review the background of the Dutch pension system and the governance questions that dominate the ongoing debate. The Dutch retirement system, which, according to Ambachtsheer (2006) has a leading role in the world of pension finance, comprised 545 funds in 2008, managing €736 billion, insuring six million active members, and 2.5 million retirees (DNB, 2008). The pension system has three tiers: a flat-rate public pension scheme, the so-called old-age pension law; earnings-related occupational plans; and private voluntary savings. The first tier, the public pension plan, ensures that every Dutch citizen between the ages of 15 and 65 who is living in the Netherlands is ensured for a public pension at old age.

The second tier, occupational pension schemes, is the focus of our paper, since Dutch pension funds' role in securing second-tier pension income is dominant compared to that in other countries. Although Dutch employers are not required to offer pension schemes to their employees, collective wage agreements are a well-embedded tradition in the Dutch labor market. In 2007, occupational pension covered 91 per cent of employees in at least some form. The overwhelming majority (96 per cent) of all occupational pension contracts are the average wage Defined Benefit (DB) type. With DB plans, employees can count on a defined level of retirement income based on their salary and years of service, often up to a maximum of 70 per cent of their average gross salary with

3

40 years of service. Further, due to lower marginal tax rates in retirement, after-tax replacement rates are usually substantially higher. For example, a pre-tax replacement rate of 70 per cent is comparable to an after-tax replacement rate that exceeds 85 per cent (Alessie and Kapteyn, 2001). The employer pays nearly 80 per cent of occupational pension premiums, and the employee pays the remainder. Post-retirement indexing of benefits is the rule, since virtually all DB pension contracts offer conditional indexation for cost-of-living increases.

In stark contrast to other Western countries, until the 1990s the third tier, voluntary pension savings, played a negligible role in Dutch households. However, voluntary arrangements have begun to emerge. Under these new plans individuals can enter into private pension arrangements with an insurance company to "top off" their retirement income. These private savings plans are subsidized by the state to cover income shortfalls in old age. The role of retirement annuities is also becoming more popular among those who seek early retirement.

Although the absolute size of pension assets is larger in countries such as the U.S., UK, and Japan, the relative size of the pension fund sector (expressed as a percentage of GDP) the Dutch pension sector belongs to one of the largest in the world (OECD, 2007).

Pension fund governance

Not surprisingly, the quality of pension fund management is of great concern to the Dutch economy and society. Basic decisions about level of pension premiums, indexing, and the investment of pension premiums are delegated to pension funds. At the center of the Dutch pension fund is the board of trustees, in principle a bipartisan board of employer and employee representatives charged with managing the pension fund. Members are not elected; instead, a co-optation model is in place, under which employers' organizations and labor unions appoint the trustees. This model is still in use today, although changing balances in boards are possible, especially with collective defined contribution schemes.

The management and governance of Dutch pension funds has undergone major changes since 2004, when a report on pension fund governance (Boer and Croon, 2004)

questioned how effective and representative the pension's board of trustees was. An outcome of the debate is that since 2007, Dutch pension funds are required to establish a participant or accountability board comprised of both active and retired members. The participant board acts in an advisory role to the board's trustees, and has the right to consult with the board on major issues. This consultation is usually focused on the design of the pension scheme, the level of contributions or indexations, or the investment policy. The participant board cannot block the decisions of the board or board members' appointments. Due to the advisory board's composition (active members and retirees), commentators regularly express their concerns that the advisory board is a single-issue council that focuses on indexation, and thus interferes with the effectiveness of the fund's management.

The accountability board offers critical assessments of the performance of the fund, assesses the annual accounts, and ensures that the fund has a well-organized administrative system and internal controls.

Pension fund knowledge requirements have been stimulated by the Dutch Central Bank, which is the pensions regulator, who continues to use education as the means to change behavior across pension schemes. Trustees are required to comply with rules relating to their knowledge of basic finance matters and understanding of the requirements.

Value of governance

The governance of private pension plans and funds revolves around the managerial control of the organizations and how they are regulated, which includes the accountability of management and how the managers are supervised (Stewart and Yermo, 2008). The basic goal of pension fund governance is to minimize the potential agency problems that can arise between the fund members and those responsible for the fund's management; a conflict of interest can adversely affect the security of pension savings and promises. Good governance goes beyond this basic goal and aims at delivering high pension fund performance while keeping costs low for all stakeholders. Thus, governance can have many positive side effects, creating trust amongst stakeholders, reducing the need for prescriptive regulation, and facilitating supervision.

In a study of a sample of large pension funds from six different countries in North America, Europe, and the Asia-Pacific region, Clark and Urwin (2007) conclude that their superior performance is linked to strong governance. Clark and Urwin's study identified various areas where the pension funds that were examined excelled, such as clarity of mission, effective risk management, and performance monitoring. Their report combines both governance capacity and investment strategy in the overall risk profile of the fund, and recommends linking the investment strategy of the fund to the governance capability of the board. Boards should first decide whether they are capable of monitoring alternative investments effectively before they begin debating on whether to include such instruments in their investment strategy.

Understanding decision making in the pension fund board room and indirectly detecting the value of pension fund governance would seem to benefit by paying attention to the vast expanding behavioral finance literature. However, contributions within this field of study focus either on the savings and investment strategies of individual workers (cf. Benartzi and Thaler, 2007; Cronqvist and Thaler 2004) or, in the case of pension and mutual funds, concentrate on defined contribution plans. Studies rarely examine the intricacies that are tied to defined benefit contracts, perhaps because the number of discretionary choices at the level of fund management can be quite large and the particular institutional setting within which pension funds operate may matter greatly.

Dutch pension funds are financial intermediaries positioned as a semi-public organization in the institutional framework; they are neither a private investor nor a government institution. The trustees have a fiduciary role to fulfill the obligations of a funded, defined benefit pension plan, typically framed within a compulsory labor agreement. Therefore, in making their choices, the trustees must balance equity and efficiency considerations. The Dutch regulators do not directly influence decision making, but set rules that indirectly restrict choices. For example, the Dutch pension law prescribes that pension funds whose ratio of assets to liabilities drops below 105 per cent are required to restore their reserves within three to five years. The funds can accomplish this aim by decreasing benefits, raising premiums, or cutting administration costs. Or funds can reposition the investment portfolio to a one in 40 chance on a yearly basis to let

the assets-to-liabilities ratio drop below the 105 per cent level, thus limiting the riskiness of the investment decisions. In addition to the (in)direct influence of the pension regulator on decision making, we cannot rule out the presence of peer effects in decision making.

3. Data and method

3.1 Set-up of the study

As noted above, we have collected our study data by using a vignette design. Each vignette represents the case of a hypothetical situation that is described by several key characteristics, all of which are important to a pension fund trustee. We create the vignettes by randomly combining characteristics. An important condition for using vignette-style surveys is that the number of characteristics used should be limited, because participants are typically unable to process large amounts of information. If the researchers introduce too many dimensions, it becomes difficult for the participants to clearly visualize the hypothetical person and situation (Rossi and Anderson, 1982). Thus, we presented each participant with ten vignettes and asked them to make a hypothetical decision for each vignette. By randomly varying the characteristics on the vignettes, we were able to determine the importance of a particular characteristic in the decision process.[1]

We performed the survey among pension fund trustees in October and November 2008. We recruited the trustees from a list of members who took courses on pension fund investments and governance. Trustees are required to take these courses to improve their knowledge of the pension fund-specific investment characteristics and decision making, which is, as noted above, in accordance with pension fund regulations. We also surveyed members from the participant and accountability board, but for practical purposes we also denote this group as trustees, since we found no discernable difference between trustees and members from the participant and accountability board in the subsequent analysis. A total of 57 trustees (95 per cent male; mean age 61 years) participated. The average experience with pension fund management was six years and on average trustees spend

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[1] For a detailed account of the use of vignette studies, see Ganong and Coleman (2006).

12 hours per month on entrusted pension fund issues.[2] A full description of the socio-economic characteristics and opinions and expectations of the trustees in our sample is presented in Table 1. With respect to opinions, the average trustee states that 126 per cent reserve ratio is an adequate buffer for pension funds and the replacement rate which offers a good pension is 75 per cent of final (net) wage income.

HERE TABLE 1

We conducted the vignette experiment because we wished to see which factors played a role in pension fund decisions. The instructions that accompanied the vignettes were as follows:

"Below you will find ten scenarios which a pension fund may encounter. Can you give us for each of the scenarios presented your choice of what you consider to be an adequate policy reaction?"

As a note to the question we added, "The ten scenarios are a randomly selected set out of a total of 360 possible scenarios. Every participant will therefore get a different set of scenarios to evaluate and formulate a policy response." We presented each participant with scenarios that a fictitious pension fund might encounter and asked them, "Can you

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[2] Before we performed this particular survey, we also conducted a pilot study among pension actuaries to see whether the scenario parameters were realistic enough for participants and whether the policy instruments mattered. During this pilot study, we made a distinction in benefit entitlements for those still working and those who were retired. This distinction did not seem to matter for participants making decisions, so we dropped this refinement and replaced it with benefit entitlements in general. As a policy instrument, we added pension age.

give us for each of the scenarios presented your choice of what you consider to be an adequate policy reaction? An example of a scenario is presented in Box 1."

HERE BOX 1

Table 2 gives the six independent variables that characterize the vignettes: life expectancy predictions; the expected interest rate; expected inflation rate; the pension fund policies of the biggest three pension funds in the Netherlands, thus capturing the effect of leadership within the pension fund industry; the actual cover ratio (assets-to-liabilities ratio) of the pension fund; and the cover ratio of the pension fund relative to other funds, thus capturing the effect of social comparison (Camerer and Malmendier, 2007). Anecdotal evidence shows remarkable similarities in the asset mixes of pension funds, despite different liability structures. What trustees at other pension funds decide to do is rarely an element that enters finance textbooks, but it would be of some significance to detect the presence of such social effects.

HERE TABLE 2

Although the number of instruments is relatively large, and although some participants took more time to fill out the survey than did others, we received no complaints about the complexity of the vignettes. The majority of the participants took 30 minutes to fill out the vignettes and some supplementary questions. The scenarios are more or less evenly represented among the group of respondents.

3.2 Descriptive statistics

Figure 1 shows how the participants use of the five policy instruments. The middle option, i.e., take no specific action with respect to a policy instrument, is the option they choose most often. This choice suggests that trustees do not want to change the course in pension policy. In other words, the status quo bias may be a decisive element in pension fund decision making, a finding that is also evident in the individual investor's behavioral finance literature (Thaler, 2005).

HERE FIGURE 1

Most of the changes are made with respect to premiums, indexing, and investments, which we expected for a setting in which pension plans are most often framed in terms of defined benefits. Premiums, indexing, and investment are the short-term instruments that leave some room for maneuvering within the rules of a defined benefit pension. Benefit entitlements and pension age are the instruments that are only changed as a last resort. It is only during the credit crunch of 2008 that for the first time in history, trustees considered a reduction of pension entitlements. If pension entitlements are used as an instrument, increases in entitlements (16 per cent of the cases) are more likely than decreases (5 per cent of the cases).

4. Are pension fund trustees loss averse?

Our central question is whether pension fund trustees react differently in good and bad times. That is, are they loss averse (Kahneman and Tversky, 1979)? Do losses and disadvantages have a greater impact on preferences than gains and advantages? For pension fund policy, loss aversion would show in the actions taken when the reserve ratio of the fictitious pension fund varies. Because pension fund trustees are members of non-profit organizations who govern over the interests of employers and employees, the loss in case of a pension fund is the failure to honor promises made to participants. For trustees, the loss can also imply a loss of freedom of choice for trustees. If the ratio of assets to liabilities drops below 105, the regulator monitors pension funds' activities more closely, requiring recovery plan by the trustees and regular financial updates from the fund.

4.1 Estimation results

To estimate the driving forces behind pension fund choices, we use multinomial logit analysis to examine the different policy options. We have reduced the five answer categories per policy instrument into three categories, because for most policy instruments some answer categories contained small numbers, thereby invalidating the

estimation procedure. For instance, for decisions on the pension premium, we analyze the probability that a trustee decides to increase the premium compared with the status quo, which would be no change of premium. We also perform this type of analysis with the other policy instruments as dependent variable.

HERE TABLE 3

Table 3 presents the results of our analyses on decisions that increase the incidence of a decline in pension premiums. Column (1) shows that decrease of the pension premium is more likely if there is an unexpected drop in life expectancy. No other coefficients are statistically significant. Column (2) shows that an unexpected increase in life expectancy increases the probability of an increase in the pension premium. Hence, the effects of demographic shocks appear to be symmetrical, in the sense that a demographic shock that reduces the liabilities of the pension fund leads to a reduction of premiums, but a demographic shock that increases the liabilities also increases the likelihood that the premium will rise. We do not observe this type of symmetry when we look at other statistical significant effects in the model. Most noteworthy are the effects of the reserve ratio: a low reserve ratio increases the likelihood of an increase in the premium (see the effect in column (2)). If the reserve position increases, then it will lower the chance that pension premiums will be raised. A one-percentage point increase in the reserve ratio lowers the likelihood of increasing the pension premium by a factor of 0.96. However – and here the asymmetry shows up – changes in the reserve ratio do not affect the chance of a pension premium *decrease*. In other words, a high reserve ratio does not induce a reduction of the pension premium.

The relative reserve position represents the most remarkable element in trustee decision making. When pension trustees perceive that their position is better than other pension funds, then there is less likelihood of a pension premium increase. We can find no discernable effect of this peer group with respect to the likelihood of a pension premium decrease.

HERE TABLE 4

The results in Table 4 show that the effects on the actual reserve ratio are more or less symmetric, but for the relative reserve position, the effect is large and asymmetric. With a pension fund trustee who perceives the reserve position to be in better shape than other pension funds, the chance that a pension fund reneges on its promise to index benefits for inflation is a factor 0.46 smaller compared to the trustee who considers the reserve position to be worse than others. Further, an increase in the inflation rate also increases the probability that indexation will only be partial, or completely absent. The reverse position – a structural decrease in the inflation rate – does not encourage trustees to be more than generous and give beneficiaries some extra compensation. However, there is an effect from the interest rate: an increase in the interest rate for the coming year by one percentage point increases the probability of extra compensation by a factor of 1.42. Part of this effect may be the result of the logic of the Dutch defined benefit pension schemes, in which an increase in the interest rate improves the reserve position. To give an impression of the size of the effect in the day-to-day life of a pension fund trustee, we note that a one percentage point increase in the interest rate (or, to be precise, the interbank swap interest rate) increases the reserve position of the average pension fund by 12 percentage points (Bonenkamp and Ter Rele, 2009). Considering the fact that a one percentage point increase in the reserve ratio raises the probability of extra compensation by a factor of 1.03, an improvement by 12 percentage points is almost right on target and translates into a factor of 1.42.

Indexing and pension premiums are policy instruments that are often used if the economic or demographic situation changes, but we want to determine to what extent other instruments are used. Table 5 shows that in the investment portfolio of a pension fund, the correlation with relevant pension fund variables is weak and only the reserve ratio, in absolute and relative terms, affects investment decisions in a one-sided manner. Whenever the wealth position of a fund deteriorates, trustees turn to cutting their exposure to risky assets. An increase in pension wealth does not persuade trustees to make the investment portfolio riskier.

HERE TABLE 5

The question of changing the pension entitlements is a hotly debated topic in times of crisis, and the 2008 credit crunch is no exception. Decreasing benefit entitlements goes to the heart of the matter of honoring obligations tied to a defined benefit pension contract. Beneficiaries may see reneging on this promise in adverse times as a breach of contract, and pension funds generally very cautious about discussing this measure of last resort. It is in the extreme good and bad times that beneficiaries may realize that a defined benefit contract does not differ much from a defined contribution contract, and the financial crisis of 2008 has been a painful reminder of that fact.

HERE TABLE 6

Table 6 shows that in terms of the level of the reserve ratio, there is also an asymmetry in the ways trustees deal with the good and bad times. The chance that a benefit decrease is considered by trustees is lower by a factor of 0.95 than that of a trustee with a pension fund that has a reserve ratio that is one percentage point higher. Raising pension benefits progresses at a slightly lower rate, but considering the enormous jumps in wealth positions during booms and busts, these small ratios translate into relatively large effects on the probability of changing benefits.

There is one other measure of last resort that is also considered in boardrooms and government offices: raising the pension age.

HERE TABLE 7

Trustees review this option at some point, but they almost never consider the reverse position, lowering the pension age. Table 7 shows that there are essentially two elements that trigger trustees to consider raising the pension age: an increase in life expectancy and a fall in the reserve ratio of the pension fund.

4.2 Simulation results

The previous estimation results give an impression of the quantitative effects. However, the baseline probabilities for each of the policy choices are absent, which makes it difficult to assess the likelihood that policy choices are actually implemented and whether trustees are loss averse to a small or a large degree. To facilitate this part of our analysis, we present some simulations of pension fund trustees making decisions in good and bad times. To clarify the results and to see whether choices differ by trustees being in an initially bad or good state, we also use the various reserve ratios to vary the initial conditions that pension funds face. However, reserve ratios are not truly exogenous, but within the framework of this experiment, in which trustees are asked for a one-time decision, the reserve ratio is, like the other scenario parameters, a fact of life. We define the good and bad times as follows:

- Good times: lower than expected life expectancy, better (than other funds) reserve level, lower inflation, higher interest rate.
- Bad times: higher than expected life expectancy, worse (than other funds) reserve level, higher inflation, lower interest rate.

Figures 2-6 illustrate the outcomes of the various simulations. Again, we find the most striking outcomes in the policy instruments that trustees seem to use most often, premiums and indexing.

HERE FIGURES 2-6

There is a high probability that these instruments will be used in extreme bad times. When the reserve ratio drops below the required 105 per cent required by the pension regulator, trustees have to act, and the probability is 81 per cent that a trustee will raise the pension premium and 90 per cent that the trustee will stop indexation. Raising pension premiums is no longer a dominant choice for reserve ratios of 130 per cent and above. This choice accords with the background questions that we posed to trustees whose stated optimal reserve ratio is on average 126 per cent (see Table 1).

14

In Figure 2, what is more surprising is that under the other extreme situation, the good times with a reserve ratio of 170 per cent, lowering pension premiums is not trustees' dominant choice; the probability of lowering premiums is only just over 30 per cent. We derive the same insights from Figure 3, where the absence of indexation is the dominant choice in bad times, but during good times extra compensation is rarely the trustee's choice. However, we do note that even at the reserve ratio of 130 per cent, which is more or less in line with the trustees idea of an optimal reserve position, the option of no indexation is still a dominant choice in bad times. In short, there is a strong asymmetry in trustees' reactions to good and bad times and the breadth of losses that define when trustees are apt to take corrective measures, but in domain of gains the status quo prevails.

The other policy instruments give an impression of how trustees deal with the obligation of honoring a defined benefit contract. The overall impression on portfolio choices (Figure 5) is that there is some movement across the spectrum of reserve ratios. Trustees become more defensive in their portfolio choices when their reserve ratios drop below the required 105 per cent. However, their choices become only marginally more risky during the simulated good times.

In Figure 5, the option of changing pension entitlements accurately reveals the stance of pension fund trustees, since even during extreme bad times the probability that pension benefits will be cut is approximately 30 per cent. However, when the very good times arrive, increasing pension benefits is considered an option. In good times, when there is a reserve ratio of 170 per cent, the probability of raising benefits is 52 per cent.
Figure 6 shows that the option of raising the pension age is not a very popular choice, even under adverse conditions. When the reserve ratio is 90 per cent and bad times hit the pension fund, the chance that the trustee will opt for raising the pension age is only 20 per cent.

4.3 Are large pension funds less prone to social comparison effects?
Pension funds in The Netherlands vary in size, with just a few big pension funds and numerous small funds. In matters of pension fund governance, size can facilitate a higher level of professionalism in governance, and also in administering and investing pension

premiums. To test the idea that pension size matters in trustees' decision making, we repeat our regression analysis, but this time we distinguish between trustees of big and small pension funds. It is hard to make a detailed case for where governance pays off. In our case, we hypothesize that social comparison effects should be either absent or at least smaller among the larger (and thus more professional) funds. The social comparison lies mainly in the way pension fund trustees compare their reserve position to that in other pension funds. Ideally, a relative reserve position should not matter in making decisions, as other funds are not going to bail out floundering funds. Further, in the case of Dutch pension funds, participants are tied to a pension fund and cannot exert the force of competition by moving to some other, perhaps better-funded, pension fund. We define the dividing line between big and small funds at €500 million in pension assets.

HERE TABLES 8-10

In Tables 8-10 we present the full estimation results for the most important policy instruments. The general outcome of this exercise is that in terms of the relative reserve position, social comparison affects the trustees of both large and small pension funds. When trustees make pension premium decisions and change the entitlements, the force of social comparison is strong among the trustees of large pension funds and completely absent among the smaller pension funds. The picture changes slightly if we consider the choice of indexing pension benefits. Here, the trustees of smaller pension funds are more apt to give in to social comparisons than are those serving the larger pension funds. However, there is the possibility that larger pension funds may have installed checks and balances that dampen or delete these behavioral biases when the individual trustees meet in committees and have to reach a consensus. Nevertheless, the fact remains that biases are not unknown in members of a large pension fund.

5. Summary and Conclusions

In this paper we offer a distillation of the choices pension funds trustees make in times of booms and busts. By way of an experiment carried out through a randomly generated set of scenarios (the so-called vignette method), we asked trustees to make decisions on an

optimal policy mix consisting of choices with respect to pension premiums, indexation, investment, entitlements, and the age of pensioners.

Our most important conclusion is the fact that pension funds are just as likely as ordinary people to display behavioral biases. Trustees display choices that are in line with the phenomenon of loss aversion: trustees are more apt to act in bad times to prevent losses than they are in good times in which the status quo prevails. Further, we find that trustees of both large and small pension funds allow their choices to be affected by the forces of social comparison; the reserve position of their fund compared to the position of other funds has a significant influence in trustees' choices of a pension fund policy mix.

These findings shed serious doubt on the manner in which pension savings are governed. Our findings may also have far-reaching implications for thinking through how bounded rationality and the self-control problems of individuals can be alleviated in everyday life. Empirical patterns of bounded rationality and commitment problems in a wide range of settings have led many scholars to question the hostility to paternalism in everyday life. The helping hand of the government may not be so bad after all, if it is properly used and respects the individual's freedom of choice. "Soft" or "libertarian paternalism," as Thaler and Sunstein (2003) call it, is the way to go. Pension savings has traditionally been a field where most Western governments have felt that some form of paternalism should be applied, and certainly the role played by governments and (mandated) pension funds that act on behalf of employees is prominent in a number of OECD economies (OECD, 2008). Behavioral finance research gives ample reasons why individual rationality and self-control are not perfect. It is commonly assumed that government can improve allocations within reasonable bounds and in taking on its soft paternalistic role it can nudge consumers in the right direction by debiasing choice, changing default rules and other options which change behavior without limiting choice (Thaler and Sunstein, 2007).

However, how the trustees make choices remains to a large extent unknown. The question that has not received much attention in the debate about soft paternalism is whether the errors of decision making at the level of 'governor' are smaller than those made at the 'governed', i.e., individual level. The tacit assumption made in models of paternalism is that the costs that result from errors made by the government are smaller

than are the costs of errors made by individuals. For pension savings, the question then revolves around whether the errors of pension-fund trustees are smaller than are those made by individual employees. This issue goes right to the heart of government-sponsored inquiries into trustee competence, legislation, and the regulation applied to standards and practice of trustee decision making and pension fund governance. In that respect, the warning formulated by Glaeser (2006) that "soft paternalism is neither innocuous nor obviously benign," is a point well taken and, as our exploratory evidence suggests, behavioral biases exist at all levels in society.

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Box 1: Description of Vignettes for Pension Trustees

We presented each participant with 10 scenarios that a fictitious pension fund might

encounter, and asked participants, "Can you give us for each of the scenarios presented

your choice of what you consider to be an adequate policy reaction?

Scenario 1:	
Prediction life expectancy of CBS	Has been lowered by 2 years
Expected interest rate coming year	Drops one percentage point
Expected inflation rate	Increases structurally by one percentage point
Current reserve level	150 per cent
Reserve level compared to other fun	Clearly worse
Policies of three biggest pension funds	Introduce major reforms

In your view, in this particular scenario what is the best policy reaction with respect to

the following instruments?

Pension premium

Considerably lower	Somewhat lower	No change	Somewhat higher	Considerably higher
☐	☐	☐	☐	☐

Inflation indexing

No **indexing**	Partial **indexing**	Full **indexing**	Indexing somewhat more than inflation rate	Indexing considerably more than inflation rate
☐	☐	☐	☐	☐

Structure investment portfolio

Considerably less risk	Somewhat less risk	No change	Somewhat more risk	Considerably more risk
☐	☐	☐	☐	☐

Entitlements of pensioners

Considerably lower	Somewhat lower	No change	Somewhat higher	Considerably higher
☐	☐	☐	☐	☐

Pension age

Considerably lower	Somewhat lower	No change	Somewhat higher	Considerably higher
☐	☐	☐	☐	☐

Table 1

Summary statistics of the main variables describing sample of pension fund trustees.

Variable	Mean	Standard deviation
Age (in years)	61.38	9.52
Experience (in years)	6.16	5.64
Hours spent per month on pension fund management	11.86	7.81
Education	3.66	1.03
Wealth pension fund[b]	2.83	1.07
Knowledge[c] of:		
Finance	2.68	0.78
Actuarial science	2.22	0.86
Statistics	2.64	0.68
Management	3.13	0.90
Stated adequate reserve ratio (assets as % of liabilities)	125.70	9.39
Stated adequate pension replacement rate (% of final wage)	75.20	8.65
Expected inflation rate (% points)	2.97	1.63
Expected interest rate (% points)	4.08	0.85
Expected life expectancy in 2050 (in years)	83.08	2.30
Perceived state of the credit crunch crisis[d]	3.27	0.98

Notes: N = 57; (a) Education is ranked as (1) primary education; (2) lower vocational education (vmbo/mavo/mulo); (3) secondary education (havo/vwo/mbo); (4) higher vocational education (hbo); (5) university.
(b) Wealth pension fund is (1) less than €100 million; (2) €100-500 million; (3) €500-1000 million; (4) more than €1000 million.
(c) Knowledge is ranked as (1) no knowledge; (2) little knowledge; (3) knowledge to some extent; (4) considerable knowledge; (5) a lot of knowledge.
(d) Perceived state of the crisis: "How likely is it that we have seen the worst of the credit crisis?" (1) highly likely; (2) likely; (3) neutral; (4) unlikely; and (5) highly unlikely.

Table 2
Description of pension scenario parameters. The values are randomly combined into vignettes.

Scenario variables:	Values of the scenario parameters		
	Base category (=0)	Other values	
1. Life expectancy	Two years lower than expected	Two years higher than expected	
2. Interest rate coming year	No change	+ 1 percentage point	- 1 percentage point
3. Inflation	No change	+ 1 percentage point	- 1 percentage point
4. Policy other pension funds	No change	Major steps to reform	
5. Relative reserve position	Worse than others	Better than others	
6. Reserve ratios: liabilities as % of assets	90; 110; 130; 150; 170		

Table 3

How do pension fund trustees decide on pension premiums in the face of demographic and economic changes? "No change in premiums" is the comparison category.[a] Relative risk ratios (RRR) represent the change in the odds of being in the categories "decrease pension premium" or "raise pension premium" rather than the comparison category associated with a one-unit change on the independent variable.

	Chance that pension funds will:			
	(1) Decrease pension premium		(2) Raise pension premium	
	RRR	t-value	RRR	t-value
Life expectancy	0.36**	2.66	1.64*	2.22
Interest rate	1.18	0.90	0.86	1.11
Inflation	0.77	1.28	1.16	1.21
Policy others	0.88	0.38	1.04	0.23
Relative reserve position	1.27	0.83	0.65*	2.14
Reserve ratio	1.01	1.23	0.96**	7.57
Observations	554			
Pseudo R^2	0.16			

(a) Method of analysis is multinomial logit analysis

*Significance at 5%
** Significance at 1%

Table 4

How do pension fund trustees decide on indexing of pension benefits in the face of demographic and economic changes? "No change in indexing" is the comparison category. [a] Relative risk ratios (RRR) represent the change in the odds of being in the categories "No or partial indexing" or "extra compensation" rather than the comparison category associated with a one-unit change on the independent variable.

	Chance that pension funds will offer:			
	(1)		(2)	
	No or partial indexing		Extra indexing	
	RRR	t-value	RRR	t-value
Life expectancy	1.34	1.25	0.67	1.21
Interest rate	0.89	0.86	1.42*	2.07
Inflation	1.36**	2.69	1.15	0.99
Policy others	1.14	1.65	1.21	0.79
Relative reserve position	0.46**	3.93	1.47	1.42
Reserve ratio	0.96**	5.97	1.03**	3.38
Observations	554			
Pseudo R^2	0.18			

(a) Method of analysis is multinomial logit analysis

*Significance at 5%
** Significance at 1%

Table 5

How do pension fund trustees decide on the risk of the investment portfolio in confronting demographic and economic changes. "No change in investment portfolio" is the comparison category. [a] Relative risk ratios (RRR) represent the change in the odds of being in the categories "make the investment portfolio more risky" or "make the investment portfolio less risky" rather than the comparison category associated with a one-unit change on the independent variable.

	Chance that pension funds will invest in assets that are:			
	(1) Less risky		(2) More risky	
	RRR	t-value	RRR	t-value
Life expectancy	0.75	1.18	0.69	1.80
Interest rate	1.02	0.13	0.78	1.89
Inflation	0.91	0.76	0.84	1.14
Policy others	1.08	0.34	1.33	1.51
Relative reserve position	0.62*	2.11	0.89	0.45
Reserve ratio	0.98**	2.93	1.00	0.20
Observations	554			
Pseudo R^2	0.04			

(a) Method of analysis is multinomial logit analysis

*Significance at 5%
** Significance at 1%

Table 6

How do pension fund trustees decide on pension benefit entitlements in the face of demographic and economic changes? "No change in benefit levels" is the comparison category. [a] Relative risk ratios (RRR) represent the change in the odds of being in the categories "decrease pension benefits" or "raise pension benefits" rather than the comparison category associated with a one-unit change on the independent variable.

	Chance that pension funds will:			
	(1) Decrease pension benefits		(2) Raise pension benefits	
	RRR	t-value	RRR	t-value
Life expectancy	0.89	0.29	0.66	1.72
Interest rate	0.66	1.92	1.26	1.65
Inflation	1.52	1.67	0.71*	2.40
Policy others	0.90	0.29	1.18	0.68
Relative reserve position	0.88	0.32	1.17	0.64
Reserve ratio	0.95**	4.01	1.03**	5.63
Observations	554			
Pseudo R^2	0.14			

(a) Method of analysis is multinomial logit analysis

*Significance at 5%
** Significance at 1%

Table 7

How do pension fund trustees decide on pension age in the face of demographic and economic changes? The odds ratio [a] represents the change in the odds of being in the category "raise pension age" compared to the category "no change in pension change", associated with a one unit change on the independent variable.

	Raise pension age (no change = 0)	
	Odds ratio	t-value
Life expectancy	2.16**	2.83
Interest rate	1.23	1.29
Inflation	0.95	0.41
Policy others	1.38	1.10
Relative reserve position	0.83	0.71
Reserve ratio	0.98**	2.83
Observations	548	
Pseudo R^2	0.05	

(a) Method of analysis is logit analysis

*Significance at 5%
** Significance at 1%

Table 8

Pension fund trustees deciding on pension premiums when confronting demographic and economic changes, by pension size. "No change in premiums" is the comparison category. [a] Relative risk ratios (RRR) represent the change in the odds of being in the categories "decrease pension premium" or "raise pension premium" rather than the comparison category associated with a one-unit change on the independent variable. Small pension funds have assets below 500 million euro; large pension funds more than 500 million euro.

	Chance that pension funds will:			
	Decrease pension premium		Raise pension premium	
	Small funds	Large funds	Small funds	Large funds
Life expectancy	-2.33***	-0.75	0.75	0.01
	(3.10)	(1.31)	(2.10)	(0.01)
Interest rate	0.13	0.48	-0.24	-0.25
	(0.56)	(1.45)	(1.20)	(0.95)
Inflation	-0.06	-0.46	-0.05	0.34
	(0.17)	(1.47)	(0.29)	(1.22)
Policy others	0.11	-0.16	-0.13	0.21
	(0.21)	(0.33)	(0.68)	(0.73)
Relative reserve position	0.04	0.57	0.08	-0.96***
	(0.10)	(1.18)	(0.32)	(3.21)
Reserve ratio	0.02	0.03	-0.05***	-0.05***
	(1.03)	(1.38)	(4.89)	(5.21)
Constant	-4.21	-5.74**	4.63	6.28***
	(1.49)	(2.16)	(4.83)	(4.83)
Pseudo R^2	0.21	0.24	0.21	0.24
Observations	291	191	291	191

(a) Method of analysis is multinomial logit analysis

*Significance at 5%
** Significance at 1%

Table 9

Pension fund trustees deciding on indexing when confronting demographic and economic changes, by pension size (Base category = indexation). "No change in indexing" is the comparison category. [a] Relative risk ratios (RRR) represent the change in the odds of being in the categories "No or partial indexing" or "extra compensation" rather than the comparison category associated with a one unit change on the independent variable. Small pension funds have assets below 500 million euro; large pension funds more than 500 million euro.

	Chance that pension funds will offer:			
	No or partial indexing		Extra compensation	
	Small funds	Large funds	Small funds	Large funds
Life expectancy	0.52	-0.01	-0.21	-0.81
	(1.38)	(0.02)	(0.43)	(1.45)
Interest rate	-0.06	-0.28	0.25	0.31
	(0.32)	(1.28)	(1.28)	(0.91)
Inflation	0.36*	0.13	0.19	0.06
	(1.87)	(0.66)	(1.19)	(0.17)
Policy others	0.25	0.01	0.66**	-0.35
	(0.70)	(0.03)	(2.12)	(0.83)
Relative reserve position	-0.97***	-0.53*	0.73*	0.56
	(3.17)	(1.67)	(1.84)	(1.17)
Reserve ratio	-0.05***	-0.04***	0.02*	0.06***
	(5.69)	(3.29)	(1.80)	(4.27)
Constant	6.47	5.65**	-4.65	-10.70**
	(4.97)	(3.55)	(2.92)	(4.63)
Pseudo R^2	0.23	0.24	0.23	0.24
Observations	291	191	291	191

(a) Method of analysis is multinomial logit analysis

*Significance at 5%
** Significance at 1%

Table 10

Pension fund trustees deciding on pension benefit entitlements when confronting demographic and economic changes, by pension size. "No change in benefit levels" is the comparison category. [a] Relative risk ratios (RRR) represent the change in the odds of being in the categories "decrease pension benefits" or "raise pension benefits" rather than the comparison category associated with a one-unit change on the independent variable.
Small pension funds have assets below 500 million euro; large pension funds more than 500 million euro.

|	Chance that pension funds will:			
	Decrease pension benefits		Raise pension benefits	
	Small funds	Large funds	Small funds	Large funds
Life expectancy	-0.00	-0.59	-0.64	-0.61*
	(0.00)	(0.88)	(1.38)	(1.69)
Interest rate	-0.37	-0.50	0.52**	0.04
	(0.32)	(1.08)	(2.13)	(0.14)
Inflation	0.56*	0.07	-0.12	0.60**
	(1.71)	(0.13)	(0.76)	(1.93)
Policy others	-0.24	0.45	0.51	0.13
	(0.49)	(0.68)	(0.93)	(0.49)
Relative reserve position	0.16	-0.89	0.10	0.92***
	(0.30)	(0.96)	(0.22)	(2.68)
Reserve ratio	-0.05***	-0.07***	0.03***	0.05***
	(2.74)	(3.54)	(3.23)	(5.45)
Constant	2.40	5.43**	-6.39***	-8.53***
	(1.58)	(2.30)	(4.42)	(6.65)
Pseudo R^2	0.14	0.24	0.14	0.24
Observations	291	191	291	191

(a) Method of analysis is multinomial logit analysis

*Significance at 5%
** Significance at 1%

Figure 1

Frequency distribution per pension policy instrument. For the variables "premium", "benefits" and "pension age" the numbers denote: (1) considerably lower; (2) lower; (3) no change; (4) higher; (5) considerably higher. For the variable "indexation", they denote: (1) no indexation; (2) partial indexation; (3) full indexation; (4) somewhat more than inflation; (5) considerably more indexation than inflation rate. For the variable "portfolio" the numbers denote: (1) considerably less risk; (2) less risk; (3) no change; (4) somewhat more risk; (5) considerably more risk.
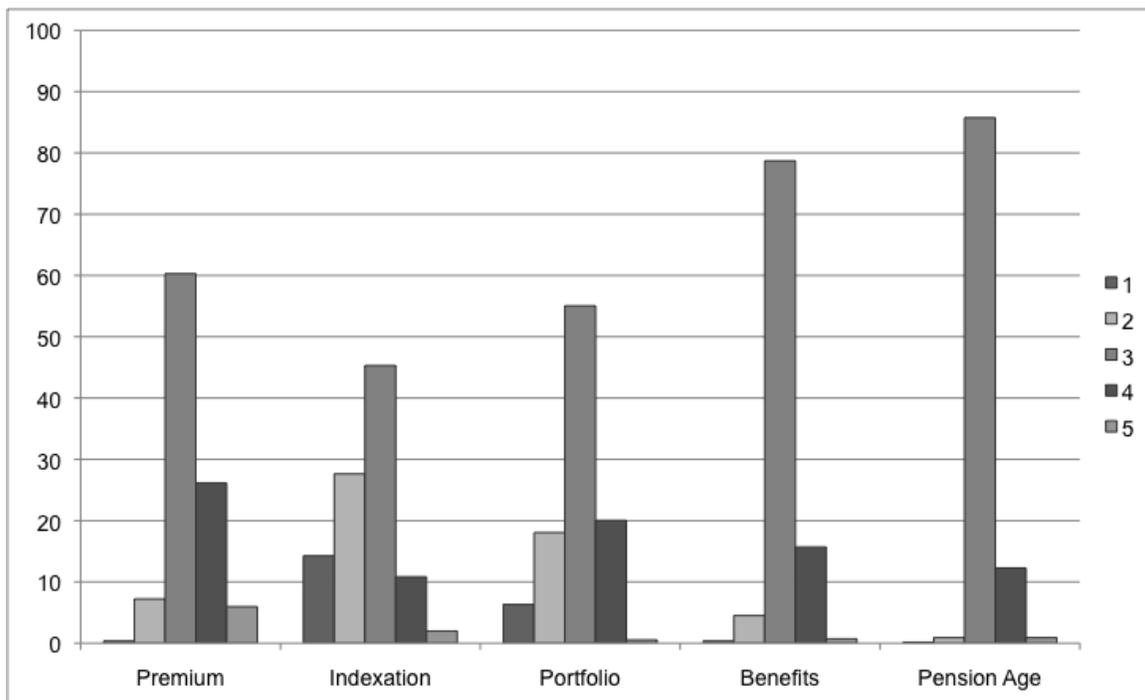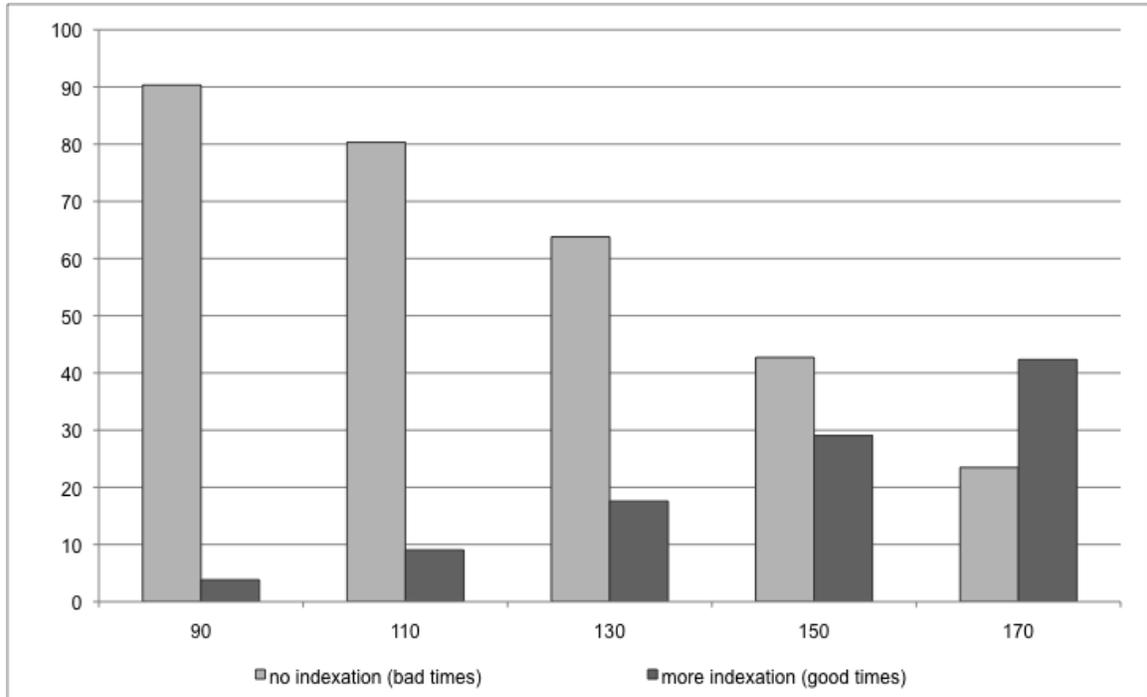
Figure 2

Pension premium choices in good and bad times. The figure shows per cover ratio the probability that trustees raise premiums in bad times, compared to the probability that trustees lower premiums in good times.
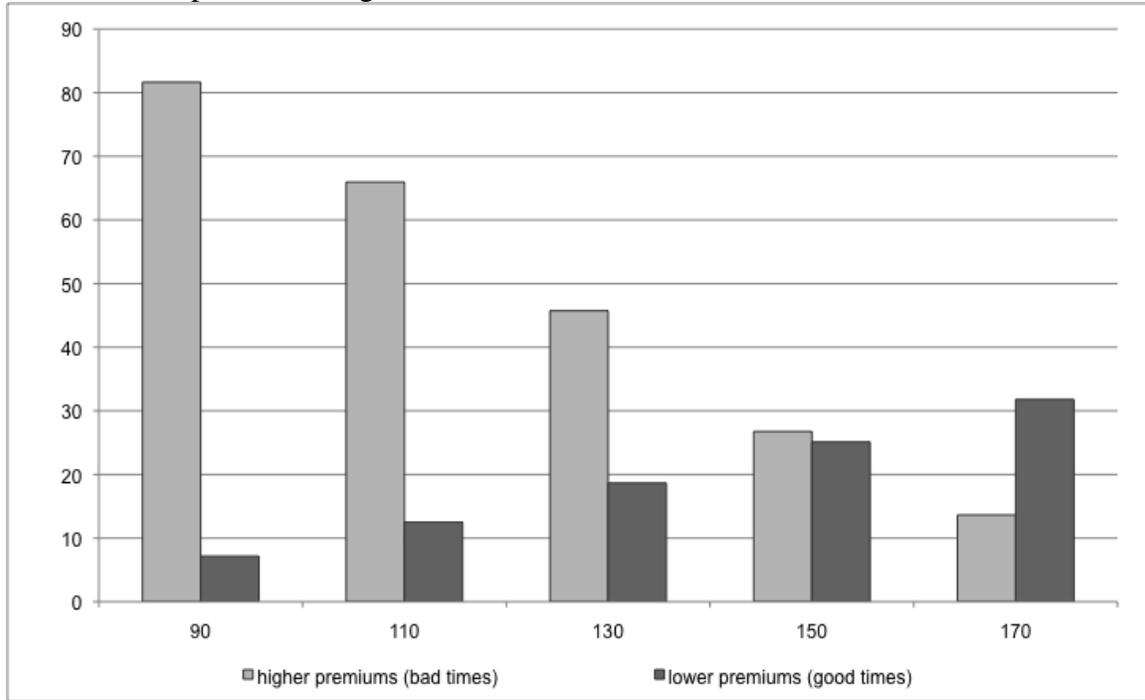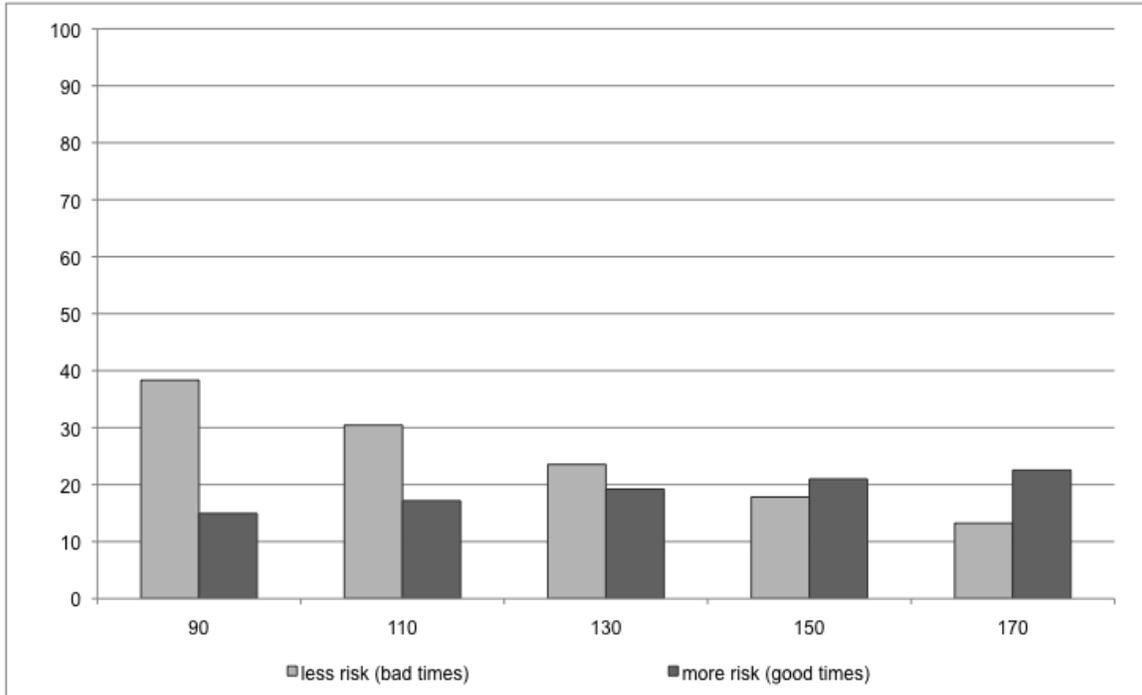
Figure 3

Indexing choices in good and bad times. The figure shows per cover ratio the probability that trustees grant no indexation in bad times, compared to the probability that trustees grant extra indexation in good times.
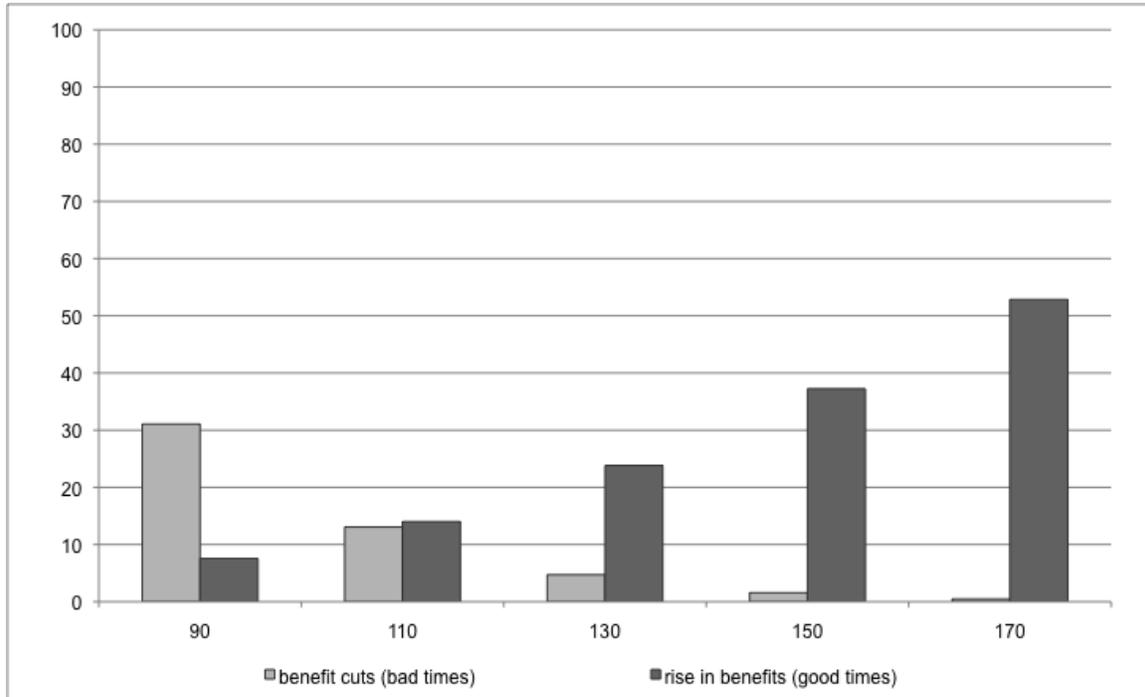
Figure 4

Investment choices in good and bad times. The figure shows per cover ratio the probability that trustees opt for an investment portfolio with less risk in bad times, compared to the probability that trustees opt for an investment portfolio with more risk in good times.

Figure 5

Changing pension entitlements in good and bad times. The figure shows per cover ratio the probability that trustees cut pension benefits in bad times, compared to the probability that trustees increase pension benefits in good times.

Figure 6

Raising pension age in good and bad times. The figure shows per cover ratio the probability that trustees raise the pension age in bad times, compared to the probability that trustees raise the pension age in good times.