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The occurrence and importance of pension fund managers' investment beliefs

A web survey and critical incident study

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Abstract

This paper examines the investment beliefs held by fund managers[3] who run and analyse public and commercial pension funds. Previous research has shown that investment beliefs explain investment policies, strategies, and decisions. Using both quantitative web survey data (n=64) and qualitative interview data (n=22) based on the critical incident technique, this research analyses the importance of six investment beliefs that are generally assumed relevant to investment decisions. This research finds that both public and commercial pension fund managers attach significant importance to six investment beliefs: Rationality, Diversification, Long-term investment, Risk and return, Expertise, and Ability to control risk. However, public fund managers show stronger support for Diversification and Risk and return beliefs than commercial fund mangers. Evidence for these beliefs is particularly revealed in interviews on critical investment decisions. The paper concludes with a discussion on the relevance of this research to pension beneficiaries.

JEL classification numbers: G11, G40
Keywords: Investment beliefs, Pension fund, Fund manager, Web-survey, Critical incident.

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1 Introduction

This study investigates the investment beliefs of pension fund managers related to public pension funds and commercial pension funds using data from a web survey sample and interviews with another sample. The study seeks to identify which investment beliefs are important to these managers as they engage in the investment or analysis of pension fund investing. The study also seeks to explain if investment beliefs differ between managers who run or analyse public pension funds and managers who do the same in commercial funds.

These issues are important for various reasons. First, investment beliefs, especially the trade-off between risk and return, influence choice in pension fund investing. In this paper we ask how fund managers rate these various investment beliefs. Second, it is generally held that fund managers in public pension funds accept a lower return in exchange for the safety of a moderate level of risk. By contrast, managers in commercial funds tolerate a greater level of risk with the expectation of higher returns [19]. We ask if this is a valid analysis of pension investment strategies.

Investment beliefs derive from a fund manager's fundamental perceptions about the financial markets. These beliefs guide day-to-day investment decisions. Based on their studies of public and commercial pension funds, Slager and Koedijk [20] and Koedijk and Slager [12] analyze investment beliefs in relationship to various scenarios and processes. They examine financial market beliefs related to risk taking, portfolio diversification, and investment time horizons. First, they show beliefs related to investment processes such as risk management. Second, they discuss beliefs related to the investment organization such as investment teams, outsourcing, and experience. And last, they observe beliefs related to environmental, social, and sustainability issues. In this study, we have chosen to focus on beliefs related to investment processes, since they are fundamental to investment decisions in pension funds.

Investment beliefs are worthy of close investigation and analysis. Pension fund managers rely on their beliefs when they offer financial advice, propose investment strategies, or evaluate and rank pension funds. If their beliefs are factually based and clearly formulated, they can avoid misunderstandings and conflicts of interests with asset owners and with people entrusted with others' property (e.g., trustees and fiduciaries). Such investors have a duty to present their beliefs explicitly and truthfully and to apply them coherently and consistently.

Investment beliefs reflect an investment philosophy that supports investment advice, strategies, and evaluations (Koedijk and Slager, 2009 [12]; Slager and Koedjik, 2007) [20]. For example, Ambachtsheer (2007) [1] describes a widespread belief in institutional fund investing that long-term investments strategies are preferable to short-term investment strategies. Raymond (2008) [18] proposes that an investment belief is a theory about assets' ability to generate revenue. Some investment beliefs, apart from guiding strategy, lie behind economic decision-making in organizations.

Previous research emphasizes that investment beliefs underlie the success of both public and commercial pension funds. Success, in this respect, is defined as a stable and high risk- adjusted return (Koedijk and Slager, 2009 [12]; Slager and Koedijk, 2007 [20]). These comments on investment beliefs are uncontroversial (Gray, 2009 [8]) and are examined in a number of empirical studies (Ambachsheer, 2008; [18] Clark and Urwin, 2008 [5]; Koedijk and Slager, 2009 [12]; Raymond, 2008 [18]; Slager and Koedijk, 2007 [20]). However, these studies focus on institutional investors rather than on individual investors or fund managers.

This study of investment beliefs extends previous research in its focus on individuals (fund managers) rather than organizations and in its comparison of investment beliefs held by public pension fund managers with investment beliefs held by commercial pension fund managers. The study uses rating data obtained from a web survey with a sample of fund managers and qualitative interview data based on the critical incident technique from a different sample of fund managers. The study was conducted in Sweden where currently the national government invests about 110 billion Swedish crowns (c. 12 billion U.S. dollars) in six public pension funds. The sum of money invested in these funds equals about one-sixth of the total value of the Swedish stock exchange. In addition, a number of commercial funds in Sweden manage pension investments for their customers[4].

2 Previous research

Relatively few studies have investigated pension investment beliefs. However, there are three interesting exceptions: studies by Halim, Miller, and Dupont (2010) [10], Koedjik and Slager (2009) [12], and Slager and Koedijk (2007) [20].

In their first study, Slager and Koedijk (2007) [20] analyzed the websites for 30 pension plans (public investors) and for 30 asset managers (commercial investors) in the United States and Europe. Building on Ambachtsheer's (2004) [1] research, Koedijk and Slager categorized investment beliefs according to capital market beliefs, organizational skills beliefs, and societal beliefs. One striking finding was that fewer than 20 percent of asset managers publish their investment beliefs.

In their second study, Koedijk and Slager 2009 [12]) examined the publicly reported investment beliefs of 23 public pension funds and 17 institutional asset managers headquartered in Australia, North America, and northern Europe. The study revealed the following: public pension funds tend to publish their investment beliefs more than commercial pension plans, risk diversification is associated with higher returns, and time horizons are not associated with performance.

Koedijk and Slager's (2009) [12] study also revealed differences between the investment beliefs of the two groups. For example, public pension funds report investment beliefs to support their decision-making whereas asset managers report

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[4] The homepage www. Konsumenternas.se recognizes 24 commercial pension funds in Sweden (the two foundations behind the homepage are the Consumers' Bank and the Finance Bureau and the Consumers' Insurance Bureau). However, the same bank or insurance company may be responsible for several fund choices. This list of commercial pension funds is probably not exhaustive

investment beliefs to demonstrate their competitive advantage. However, the greatest area of difference between public pension funds and commercial asset managers concerns their beliefs about risk. Public pension funds focus on balanced risk exposure through long-term investment diversification. Commercial asset managers focus on their “particular investment styles,” their “asset pricing expertise,” (p. 19) and their teams of portfolio managers. However, the authors do not explain clearly the investment strategies of the asset managers.

Halim, Miller, and Dupont (2010) [10] conducted a study on the management of investment risk at 58 pension funds (20 commercial funds, 32 public funds, and 6 others) in North America, Australia/New Zealand, and Euope. The total assets of the funds were valued at almost 2 trillion USD (on average, 32 billion USD each). They showed that investment beliefs vary significantly in the pension fund industry, depending on the importance attributed to the influence of market forces on pension liabilities. They also found that 85 percent of the funds surveyed had a risk framework in which investment beliefs as well as regulations drive management of risk. They found that “risk monitoring is widespread although not universal” (p. 35) and the larger funds engage in more risk monitoring. One interesting finding is that commercial pension funds in the United States employ fewer staff in risk management than commercial pension funds in Canada, Europe, and Australia/New Zealand. U.S. public pension funds have still fewer staff in risk management. The authors cautiously conclude that investment beliefs focused on risk might relate to better fund performance.

2.1 Basic investment beliefs

We propose six investment beliefs based on functions in the capital markets and how people respond to those functions (cf. Slager and Koedjik, 2007) [20]. These beliefs consist of investment concepts such as risk and return, diversification, investment time horizons, and others. In this section we describe the six key investment beliefs that underpin our research.

Rationality of markets. An important debate in economics concerns the rationality of the capital markets (Arthur, 1995) [3]. A basic investment belief among economists is the efficient market hypothesis (EMH), which claims that all market information is fully reflected in market prices. The EMH implies that all actors in the capital market (individuals and organizations) behave as rational economic beings by maximizing utilities. Behavioral economists, however, suggest that individual actors or representatives of organizations do not always behave in a rational or utility maximizing manner. At times, people act irrationally when they make economic decisions (e.g., Kahneman, Slovic and Tversky, 1982) [11]. Such irrational behavior has consequences for markets and their efficiency. Others (e.g., Lo, 2009) [14] have proposed the adaptive markets hypothesis (AMH). This hypothesis holds that markets evolve in an evolutionary manner such that investors learn from their failures and successes.

Diversification of investment risk. This widely held investment belief is that diversification of investments is a way to manage risk. For example, people can spread their risk by investing in a variety of assets (monetary and non-monetary) and in various companies and/or industry sectors. Investment funds, such as pension funds, that take a long-term perspective commonly maintain a highly diversified portfolio of stocks and bonds (Koedijk and Slager, 2009) [13]. However, it has been argued that diversification is inefficient in bear markets (e.g., Koedijk, 2010) [12].

Risk and return. An often-stated investment belief is that high-risk investments may produce high returns. This relationship is a postulate of the capital asset pricing model (CAPM) and portfolio theory (Markowitz, 1952) [15].

Long-term investment. This investment belief is that long-term investing (e.g., for at least five years) is a wiser strategy than short-term investing (Slager and Koedjik, 2007 [20]; Skr 2011/12:130 [19]). In an article on long termism, Ambachtsheer (2014) [1] argues that pension funds should invest for the long-term for two reasons. First, long-term investments support the positive evolution of companies; second, pension funds have a responsibility to future generations. In a study of 180 pension fund managers, Guyatt (2005) [9] found that the managers think long-term investments generally perform better than short-term investments.

Risk control. An investment belief in risk control means that investors have the power to manage risk in their portfolios, for example, by diversifying or by taking a long-term perspective. When risk is controlled effectively, the belief is that investors can expect higher returns.

Expertise. An investment belief in expertise means that a fund manager who have more financial knowledge and experience than others will have greater investment success. This is acquired by education and experience. Pension fund managers are assumed to have such expertise (e.g., Skr, 2011/12; [19] Tamaki, 2012 [21]). According to their general theory on expertise, Ericsson and Smith (1991) [6] claim it takes at least ten years of experience in a field to achieve expertise status.

3 Method

3.1 The Web Survey

In this survey we examined the investment beliefs held by fund managers employed by public pension funds or by commercial pension funds in Sweden. We were inspired by Koedijk and Slager (2009) [13] who studied "sensible investment beliefs" held by institutional investors. Our aim was two-fold: to compare the investment beliefs held by these two groups and to compare our results from this survey with the interview results from another group of fund managers.

Web survey participants. The web survey participants were pension fund managers and analysts at Swedish public pension funds or at Swedish commercial funds (e.g., mutual fund companies, investment banks, and insurance companies). We distributed 137 questionnaires, of which 64 were completed (females = 4, Mage = 41 years), resulting in a response rate of 46.7%. Of the 64 participants, 23 participants worked for one of the four major Swedish public pension funds (the

AP funds) and 41 worked for commercial funds. Four participants held a top management position (e.g., CEO), nine were senior investment officers, forty were fund managers, and eleven were financial analysts. Their average number of years of work experience in the financial industry was 15 years. Five participants had doctoral degrees, fifty-four had university degrees, and five had college degrees.

Employer institutions. The 17 investment institutions in the study are members of the Swedish Association of Fund Companies (Fondbolagens förening). We requested these institutions to provide contact information for employees willing to participate in our survey. We sent a welcome letter to each employee describing the study and its aim. One week later we sent an email to the participants with a link to our web survey. Participants had a timeframe of one week to take the survey, which closed on the 9th of September 2015.

Web survey. The survey is a Qualtrics web instrument with seven sections [background, investment beliefs, risk norms, financial self-confidence, affective state (PANAS), risk attitude, and risk preference]. In this paper we address only the responses on investment beliefs.

The survey posed statements related to the six investment beliefs described above. Possible responses, on a five-point Likert scale, ranged from 1 (I do not agree at all) to 5 (I completely agree). See the Appendix.

Analysis. We used t-tests and Pearson product moment correlations for the statistical analysis of the data. Table 1 compares the investment beliefs of public and commercial pension fund managers. Tables 2 and 3 present the Pearson correlations of investment beliefs among public and commercial pension fund managers, respectively.

3.2 The critical incident interviews

Participants. We contacted 22 fund managers by telephone. None of them had participated in the web survey. All participants worked with public pension funds or commercial pension funds. Participation was voluntary. Of the 22 participants, 16 were from public pension funds and 6 were from commercial funds. Nineteen participants were men and three were women. Their mean age was 44 years (SD=7.83) and their mean number of years working in pension fund management was 13.5 years (SD=6.73). Twenty-one participants had university degrees and one participant had a college degree.

Interviews. Two authors conducted the interviews at the participants' workplaces. We used the Critical Incident Technique (Flanagan, 1954) [7]. In this interview technique, participants are asked to recall their most recent critical decision situation and then to describe the decision they made and why. We used this interview technqiue three times with each participant, recorded the interviews and later transcribed them.

Analysis. In the analysis of the interview data, we took a content analysis approach (Miles and Huberman, 1994) [16]. Using this approach, we focused on participants' descriptions and explanations of critical investment decisions in which they relied on their investment beliefs, directly or indirectly. Specifically, we searched for expressions of investment beliefs that were similar to the six investment beliefs used in our web survey. Two authors separately analyzed the interview data and then compared their analyses.

4 Results

Web survey results. Public and commercial fund managers agreed on four investment beliefs: Rationality, Long-term investment, Expertise, and Ability to control risk. They disagreed on two investment beliefs: Diversification and Risk and return. See Table 1. Public fund managers expressed stronger beliefs than the commercial ones in both Diversification and Risk and return.

Table 1: Differences in investment beliefs between public and commercial pension fund managers

	Group		
Beliefs	Public pension funds (n = 25)	Commercial pension funds (n = 39)	t
Rationality 1	1.8 (0.62)	1.7 (0.59)	0.56
Diversification	3.5 (0.55)	3.1 (0.70)	2.29*
Long-term investment	3.5 (0.63)	3.8 (0.53)	- 1.76
Expertise	3.0 (0.67)	2.6 (0.77)	1.79
Risk and return	3.9 (0.66)	3.5 (0.72)	1.99*
Ability to control risk	3.0 (0.60)	2.7 (0.60)	1.73

Note. * = p < .05, 1 = scores reversed on this scale, meaning that low values denote irrationality of market beliefs.

We also conducted a correlation analysis (Pearson correlations) on the investment beliefs for the two groups. See Tables 2 and 3.

As Table 2 shows, the correlation analysis for public fund managers revealed no significant correlations among the six investment beliefs. This is assumed to represent a rather distinct separation of the six investment beliefs.

Table 2: Pearson correlations of investment beliefs among public pension fund mamangers (n =25)

Variable	M	(SD)	1	2	3	4	5	6
1. Rationality	3.21	(.59)						
2. Diversification	3.39	(.66)	-.128					
3. Long-term investment	3.52	(.63)	.078	.072				
4. Expertise	1.96	(.64)	.254	-.142	-.113			
5. Risk and return	3.87	(.51)	-.018	-.020	-.024	-.064		
6. Ability to control risk	3.04	(.52)	-.079	.217	-.304	-.026	.296	

Note. * = *p* < .05, ** = *p* <. 01.

In contrast, commercial fund managers' investment beliefs were interrelated with each other. As Table 3 shows, Rationality and Risk and return among commercial fund managers were significantly and negatively correlated (r = -. 385, p = .016). This means that these investors believe the capital markets are emotional, irrational, and short-term-oriented. There is a weak relationship to Risk and return.

Risk and return correlated with all investment beliefs except Long-term investment. Risk and return was positively correlated with Diversification (r = .379, p = .017). Therefore, for commercial fund managers, a stronger belief in Risk and return was associated with a stronger belief in Diversification. Belief in the Ability to control risk was also correlated negatively with Rationality (r = - .329, p = .041), which implies that commercial fund managers think it is feasible to control risk, despite the irrationality of the capital markets. Risk control also correlated positively with Diversification (r = .356, p = .026), which means diversification can be used for risk control. In addition, Ability to control risk correlated negatively with Expertise (r = .419, p = .008), which means that the commercial fund managers may believe that financial expertise is not needed to control risk. Finally, Ability to control risk correlated positively with Risk and return (r = .587, p = .000), which may imply that risk control can be used to achieve high risk-adjusted returns.

Table 3: Pearson correlations of investment beliefs among commercial pension fund managers (n =39)

Variable	M	(SD)	1	2	3	4	5	6
1. Rationality	3.29	(.62)						
2. Diversification	3.01	(.72)	-.276					
3. Long-term investment	3.78	(.53)	.015	-.304				
4. Expertise	2.59	(.86)	.190	-.193	.188			
5. Risk and return	3.53	(.78)	-.385*	.379*	-.054	-.073		
6. Ability to control risk	2.87	(.81)	-.329*	.356**	-.158	-.419**	.587**	

Note. ** = p < .01, * = p = <.05.

In summary, results from the web survey show that the six investment beliefs we proposed were highly rated, i.e., fund managers' agreed in them. However, there are two notable differences between public and commercial fund managers. The public investors generally agreed stronger of the investment beliefs than the commercial investors with the exception of *Long-term investment*. Moreover, public investors supported Diversification and Risk and return beliefs stronger than commercial fund managers. In addition, the commercial fund managers' beliefs were interrelated with each other, while the beliefs of the public fund managers were separated.

Critical incident interview results. We found the interviewed fund managers described investment decisions that reflected investment beliefs similar to the investment beliefs identified in the web survey. We counted 38 incidents in 22 fund manager interviews of such investment beliefs. In this section we quote relevant

comments from the interviews, organized according to the six investment beliefs. We use the following key to identify which fund manager group the speaker belongs to:
P = public pension fund manager
C = commercial pension fund manager

1. *Rationality*. Beliefs vary. Some investors believe the capital markets behave irrationally, some believe the markets behave rationally, and some are ambivalent.

I believe that perhaps the market does not really follow a logic. (P)

It is the response pattern of the market, which to some extent is difficult to describe as a logic. (P)

It was a rather typical situation. If the market reacts negatively, as it did, you must make a judgement whether this is an opportunity, whether the market over-reacted, and so on. (P)

Partly, the distortion in results was large. Then the market movements of the shares was large. Is this an over-reaction or is it reasonable? (P)

It is February 2009, and the market has gone down a lot. The common view is that the end of the world is near. Then I noticed that the stock market had stopped falling. I had also observed that the central banks had responded rather forcefully. And risk/return will end somewhere. Can the stock market go down any more? Yes, it is possible. How large is the downside, how large is the upside? Several hundred percent. Should one be bold and believe the market will rise from this point in time? Yes, we decided that it would. (C)

We saw there was an opportunity. Here is something that the market has overlooked. (C)

It (the share value) may go down somewhat. But when the market understands (it will go up), the market has misunderstood something. And this caused us at this point in time to buy this (shares). (C)

The conclusion is that the market will not focus on this for a longer period. It is better to sit still and do nothing. (C)

2. *Diversification.* The following comments are representative of the importance of diversification to the fund managers.

My role is to diversify the fund manager risks. We have already decided to invest in growth markets. The next step is how to diversify the risk that we have in growth markets. We do this by employing more than one fund manager. In that way, we diversify the fund manager risks. (P)

It is always a challenge…what price did we pay? And does it create enough diversification in our risk? (P)

3. *Long-term investment*. Few fund managers stated a belief in the benefit of a long-term investment strategy. However, the next comment is an exception.

We attempt to work with long-term perspectives. We are long-term investors, so we don't try to 'play' in a quarter of a year timeframe or by quarter events. (C)

The Swedish national government requires Swedish public pension funds to make long-term investments (5 years or more). This requirement seems to explain why no public fund managers expressed any particular interest in the long-term investment belief.

4. *Expertise*. The fund managers expressed strong support for this belief. Several public investors said they depended significantly on in-depth knowledge when making critical investment decisions.

The specific challenge was really to manage a variable that we didn't know how to manage. We had too little knowledge, too little conviction, and too little support that it was going to be successful. (P)

Other fund manager were quite specific about the kind of expertise they believe in.

It is like this. When we made up our forest strategy we worked together with XX [name of a person]. He is 'the McKinsey of forests.' (P)

It has been like solving a puzzle. By relying on information about companies, about competitors, and other places, we reach a conclusion. It was a rather pressing situation with telephone conferences with the company and analysis of the research. (P).

Other fund managers said they required more knowledge for investment decisions:

We were thinking of making an investment in a fund by using an external fund manager. The decision was whether to invest or not. The external fund managers handle things that we cannot manage ourselves. They seem to be very skilful with a good track record. That's why we were interested. (P)

We make judgements ourselves, but we rely on others. For example, we use a bank an analyst to get the facts. We also use Bloomberg for analysis. (C)

They made an incorrect prognosis. And we talk a lot with analysts. We receive assistance from bank analysts a lot when we make our decisions. (C)

5. *Risk and return*. Fund managers had a good deal to say about the relationship between risk and return.

If we were wrong, we would miss a great opportunity. But if we were right, we would have another great opportunity. The return was fairly positive and fairly negative. (P)

I make an analysis of a product we might invest in. I look at the risk. My task is to understand how this works and to give advice on how we can make money on this investment. (P)

In this case we bought shares in an Italian bank. In my job, you are often paid to take risks. One may say that we sell risks and buy shares. We take risks and hopefully earn a return. (P)

6. *Ability to control risk*. One fund manager described the importance of anticipating events as a way to control risk.

The situation was such that the market and we (the fund) were fairly certain that the Brits would say yes [to remain in the EU on the Brexit vote]. Then, on the night between Thursday and Friday, the election result revealed that Brexit had passed. We had prepared for this result with exercises ending in different ways. We were well prepared because we knew the characteristics of our portfolio and our financial exposure. (P)

Three commercial fund managers emphasized the importance of risk control:

This situation escalated in the first or second week in February. During that period I was working to sell off our bank bonds. (C)

The initial feeling and reaction was that we must sell. We must safeguard our money. (C)

We decided to begin to sell off our shares. We simply felt that the risk was too big to own these shares. We were major investors. (C)

In summary, results from the interviews validate the web survey results (as well as previous findings in the literature) with respect to the agreement on the six investment beliefs. These results also reveal rich and varied descriptions of how the fund managers perceive and use these beliefs in their day-to-day investment decision-making. Last, the commercial fund managers gave several incidents of investment beliefs concerning risk control, while public fund managers were more expressive about risk and return and less about diversification and long-term investments.

5 Discussion

Our investigation shows that the six investment beliefs reflect fund managers' mental models of investments. This observation is a new contribution to the pension management literature since previous research on investment beliefs related to pension funds have used policy documents, websites, or surveys with the heads of pension fund organizations rather than fund managers themselves. This strengthen the importance of investment beliefs since we have showed that such beliefs are common and occur in the minds of individual investors and are not only a policy phenomenon in pension funds.

In this study we also show that individual fund managers for both the public pension funds and the commercial pension funds support all six investment beliefs. They also base their investment decision-making on these beliefs. Nevertheless, the fund managers vary as far as the extent of their support for, and use of, the six investment beliefs. An individual's affiliation with a public or commercial pension fund organization, respectively influences his or her support for an investment belief. We found that public fund managers expressed stronger support for two investment beliefs – Diversification and Risk and return – than commercial investors. This is another new finding adding to the pension fund literature.

This last result may have implications for beneficiaries of pension funds. Pension fund beneficiaries expect a steady, reliable stream of pension distributions in their retirement years. Such beneficiaries may feel more confident with investing their savings in funds that prioritize Diversification and Risk and return. However, our research also concludes that commercial investors seem to have a more coherent set of investment beliefs than the public investors. Some pension fund beneficiaries may be more comfortable with funds that prioritize logic and consistency in investment decisions.

Finally, we asked if higher risk taking is typical for commercial fund managers in investment decisions. Survey results do not lend support to this view, but in interviews about critical investments commercial fund managers often expressed interest in discussing risk control. We suggest that investment risk is an important issue to all pension fund managers making investment decisions irrespective of whether the organization they belong to is public or commercial.

6 Conclusions

In this section we present our conclusions about the fund managers' six investment beliefs. We list these conclusions based on how strongly they hold these beliefs.

Risk and return. All fund managers ranked this belief as their strongest belief although public investors were more supportive than commercial investors. The risk and return issue appeared frequently in the interview descriptions about decision-making in critical incidents such as the decision to invest in new companies engaged in risky ventures.

Long-term investment. This belief ranked second strongest, with more support by the commercial fund managers. The public fund managers, who are required to invest for the long term (five years minimum), are bound by law to this belief. Therefore, they may take this belief for granted. The greater emphasis on long-termism by the commercial fund managers may be explained by that their organizations also emphasize long-term investing in pension funds.

Diversification. This belief, which ranked third strongest, was especially supported by the public fund managers. We suggest the explanation for these investors' greater support of portfolio diversification is that they are more risk-averse and also less influenced by competition which is prevalent in commercial funds.

Ability to control risk. This belief ranked fourth strongest. Public fund managers ranked this belief slightly higher than commercial managers. An explanation may be that boards of directors and/or top managers at public pension funds have stronger risk control policies. Such policies are likely because of the government mandates on accountability by such funds. Another explanation for its fourth place ranking may be that other risk-related beliefs (i.e., Risk and return and

Diversification) overshadow the Ability to control risk belief. It is clear that the commercial fund managers associate the Ability to control risk belief with the Diversification and Risk and return beliefs. Therefore, they may not distinguish among the three to any great extent. Commercial fund managers' support for the Ability to control risk belief was negatively correlated with their support for the Rationality and Expertise beliefs. These investors may think they can control risk (and increase returns) solely through diversifying their portfolios and planning for the unexpected. For example, they planned for the possible investment repercussions from the Brexit vote in Great Britain.

Expertise. Public fund managers were more supportive of Expertise in ratings than commercial ones. However, in interviews all participating fund managers irrespective of public or commercial employer were inclined to consult external financial managers or analysts when evaluating investment opportunities.

However, some commercial fund managers do not think expertise is needed to manage risk. What is the explanation of this surprising opinion? We suggest that commercial investors think the volatility in the capital markets is essentially unpredictable. Therefore, expertise provides no particular advantage in anticipating the rise and fall of share prices.

Rationality. This belief ranked last of the six investment beliefs. It ranked well below the mean of the scale (< 2) in the sample. The conclusion is that the investors generally believe the capital markets reflect irrational and emotional decision-making with an emphasis on short-termism. They described sudden market movements as illogical over-reactions to current events, rumours, etc.

Yet the investors are not dice throwers. They do not pick their investments randomly. Despite their belief that irrational and arbitrary whims often influence the capital markets, they maintain some confidence in the bounded rationality of the markets. This conclusion is supported by, for example, the efforts both investor groups take to control risk through portfolio diversification.

Differences between public and commercial pension fund investors. The two investor groups rated the importance of four investment beliefs equally: Rationality, Long-term investment, Expertise, and Ability to control risk. However, public fund managers rated Diversification and Risk and return higher than the commercial ones. We explain this difference by the influence of the requirements and regulations governing public pension funds.

Our research partially confirms other pension management research in which investment beliefs were found to correlate with fund performance achieved through diversification (Koedijk and Slager, 2009 [13]; Slager and Koedijk, 2010 [20]). We found that public fund managers strongly support portfolio diversification, even more than commercial fund managers. On the other hand, all investment beliefs we tested were generally agreed on. Only rationality of markets was less agreed on. We conclude that fund managers approve of investment beliefs which is important for pension fund's performance.

Implications for pension fund investors and their beneficiaries. Previous research has shown that investment beliefs and policies are relevant in the analysis of pension fund performance (Asher and Azad, 2015 [4]; Koedijk and Slager, 2009 [13]; Slager and Koedijk, 2010 [20]). Our results show that fund managers (public and commercial), in varying degrees, support the six investment beliefs identified in the literature. We found that these fund managers refer, directly or indirectly, to these investment beliefs when they make difficult investment decisions. These results should be of interest to pension fund beneficiaries as they seek pension investment beliefs that align with their own beliefs. People receiving pension benefits and people saving toward retirement may well have different investment beliefs as well as goals. If they have more insight into individual fund managers' beliefs, they are in a better position to evaluate the policies and strategies behind the management of their pension savings.

7 Limitations

Our two research samples were not randomly selected (although the web-survey sample is rather large). Therefore, we admit our results are not generalizable to all pension fund managers. Nor are they generalizable to countries where government-managed pension funds are not available.

8 Suggestions for further research

We recommend that researchers conduct more empirical studies that examine fund managers' investment beliefs. We welcome research (framed like our research) that may confirm or reject our results. Our research was conducted in Sweden, a country that offers public pension fund investment opportunities. We think research on such public pension fund investing in other countries that have different laws than Sweden could be of interest. All such research could improve the transparency on and the effectiveness of pension fund management.

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Appendix

Items used to measure investment beliefs with mean ratings (M), standard deviations (SD), and Cronbach Alpha values for the index are in parentheses.

Ratings were conducted on a five-point Likert scale ranging from 1 (Do not agree at all) to 5 (I completely agree).

Rationality (M=1.8; SD=.628; α=.71)
The stock market tends to react emotionally.
The stock market is irrational.
The stock market has a short-term perspective.

Diversification (M=3.3; SD=.631; α=.61)
Spreading your risks usually gives you a higher return at a lower risk.
Spreading your risks is usually the most efficient way of achieving a high return in relation to a given risk.
Spreading your risk reduces your chance of a very high return.

Expertise (M=2.2; SD=.727; α=.65)
Professional investors are better at judging financial risk than lay people.
It is impossible for anyone, including professional investors, to forecast the value development on financial assets such as shares.
Professional investors have no better chance of a high return in the stock market than people who make random choices.

Risk and return (M=3.3; SD=.659; α=.73)
There is a strong positive connection between risk and return.
Investments with higher risk have a better chance to produce high returns.
Risk taking in the long term produces lower investment returns.
You have to take financial risks to achieve high returns.

Long-term investment (M=3.4; SD=.645; α=.62)
Long-term investments contribute to a better value development from the invested capital than short-term investments.
There is a positive relationship between a long-term perspective and a high return in relation to the risk taken.
By taking a short-term perspective and quickly adjusting to the market, an investor will have better conditions for producing high returns on investments.

Ability to control risk (M=2.8; SD=.647; α=.64)
Risk in the stock market can to a large extent be controlled.
Risk in the stock market can to a large extent be predicted.
Risk in the stock market cannot be reliably estimated.