Bibliography

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1 Introduction

According to the OECD, in 2016 the U.S. had the largest pension market with assets worth 25.1 trillion USD (OECD (2017)). It is no surprise, then, that the literature on the U.S. pension market and other similar investment entities, such as endowments funds, is extensive. The literature covers topics such as fund performance and its relationship to asset allocation and active management, accounting practices and liability measurement, and political and social factors that influence pension board management behavior. Below, I outline these areas of research and discuss how my research question is situated in the literature.

2 Valuing Liabilities

Some previous research on pension management has focused on pension asset-liability management and discount rate. Pennacchi and Rastad (2011) showed that the way pension funds value their liabilities can influence their exposure to systematic risk in investing. There are two primary ways in which pensions discount their liabilities: (1) they utilize the Government Accounting Standards Board (GASB) actuarial approach which uses the expected rate of a pension's asset returns rather than the actual risk of the pension plan's retirement payments to discount their liabilities or (2) they use the market value approach based on finance theory which finds the present value of liabilities based on pensioners' years of service and salary. According to Pennacchi and Rastad (2011) and Brown and Wilcox (2009), using the GASB actuarial approach encourages boards to invest in riskier assets because it allows funds to reduce the value of their liabilities with a higher discount rate. Brown and Wilcox (2009) also discussed how this method might cause a decrease in sponsors' obligatory feelings to contribute. Novy-Marx and Rauh (2009) also argue that using these procedures understates funds' liabilities, and further call for funds to separate investment management and liability measurement.

This section of the literature shows the complicated relationships between ac-

counting standards and investment behavior, which influences returns. Any model that discusses fund performance must account for the method of liability discounting. My review of this section of the literature has thus demonstrated that I must account for liability management in my research.

3 Asset Allocation and Performance

According to modern portfolio theory (which originated with Markowitz (1952)), when constructing an optimal portfolio, investors must balance the individual portfolio risk contributed by each investment with the expected return of the investment. Traditional financial wisdom thus argues that asset allocation is one of the major components of investment return. Previous pension research on asset allocation has focused on the factors that influence fund exposure to high-risk assets such as stocks. For example, Lucas and Zeldes (2009) analyzed whether funds increase their allocation to stocks when they have wage-sensitive liabilities (i.e. there is a high ratio of currently-employed pensioners to plan retirees). They found no evidence of this. However, Lucas and Zeldes (2009) and Weller and Wenger (2009) found that pension plans with higher funded ratios do have higher allocations to stocks.

Researchers often compare actual fund allocations to a benchmark optimal allocation to risky assets (such as stocks) in order to see how the actual allocation differs from the allocation expected in financial theory. According to Weller and Wenger (2009), the formula for this optimal allocation is determined by the risk-return trade-off between a risky and a risk-free asset:

$$w^* = \frac{(a - r)}{\delta\sigma^2}$$

As they say, "the optimal share of equities, w^*, is equal to the ratio of the difference in the expected rate of return of equities (a) and that of risk-free short-term government bonds (r), relative to one-year variance of equity prices (σ^2) weighted by an investor's risk preferences, δ.

The studies mentioned above focus on asset allocation as an essential component of investment return. However, other research looks at how diverse factors influence investment return. In a study of university endowment funds, Brown et al. (2010) looked at how market timing and security selection, along with asset allocation decisions, contributed to the variation in endowment returns over time and cross-sectionally. They found evidence that asset allocation is amajor driver of performance over time, because 74.42% of the variation in returns over time came from asset allocation, while only 14.59% came from market timing and 8.39% came from security selection. However, when they analyzed the data cross-sectionally, they found that only 11.10% of the variation came from asset allocation, and 74.69% came from security selection. Thus, rather than focusing only on asset allocation, analysts of pension funds also need to look at active management of portfolios, which I discuss in the next section.

4 Active Management

In a study of pension funds from 1990-2008, Aglietta et al. (2012) looked at three major components that effect pension performance: market movements, asset allocation, and active management. This research, much like the Brown et al. (2010) study mentioned above, shows that active management plays a substantial role in generating returns once market movements are accounted for.

Other researchers have analyzed whether poor performance effects active management behavior, such as Weller and Wenger (2009), who looked at whether underfunding from the 2000 financial crisis caused managers to behave imprudently. Imprudent behavior was defined by four actions: no portfolio rebalancing, employer conflicts of interest, trustee conflicts of interest, and failure to implement best investment practices. These researchers found that there was no evidence of imprudent behavior in the form of changes in portfolio rebalancing and active management. Additionally, they found no evidence of employer or board conflicts of interest.

5 Board Composition and Bias

The last major focus of pension research I surveyed were studies related to board composition and bias. A recent study of political affiliation on pension boards by Bradley et al. (2016) found that as the number of politically-affiliated trustees increased, funds allocated more to risky assets. These researchers, like many others, found that funds exhibit a local bias and invest in local firms more frequently (they overweight local firms by 26% relative to the market portfolio). They found evidence that these investment choices that arise from conflicted political motivations are detrimental to pension funds' performances. Other research on pension boards' allocations to private equity by Hochberg and Rauh (2013) find similar local bias behavior and underperformance of in-state investments.

Work on political bias by Bonaparte et al. (2017) shows that individual investors are more optimistic and perceive less risk in investing when their preferred political party is in power. They are more willing to invest in risky assets when this is the case, and they are more conservative when the party they oppose is in power. Relatedly, Pennacchi and Rastad (2011) found that pension boards with a higher proportion of members who are participants take on more risk in the form of tracking error.

6 Conclusion

My research is situated in these questions about the contribution of board composition and bias to the performance of funds. I would like to look at how political and social factors in a state (such as pensioner type, political party, and division/cohesion of political leadership) influence pension funds' allocation to equity. This study would analyze whether government cohesion, political leanings, and employee type would influence the riskiness of pension fund managers' behavior.

As I have laid out above, previous research on pension funds has looked at how valuation of liabilities, asset allocation, and active management effect the performance and funded ratio of funds. Thus, in my research I will attempt to account for some of

these findings by controlling for funded ratio and liability discount rate in my model.

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