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Public Retirement Systems: An Examination of Governance Characteristics and Their Impact on the Funded Ratio

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Executive Summary

By almost all accounts, the fiscal health and stability of the United States public retirement system at all levels is in peril. Collectively, local and state public retirement systems are underfunded at a rate of $700 billion as a low estimate to $3 trillion as a higher estimate. While plenty of research has been conducted to identify the reasons that programs are underfunded, the system would be best served if more attention were paid to identifying program characteristics that improve performance. In turn, these characteristics could be evaluated and implemented if not already present. If programs do not want to collapse and governments do not want to cut services to pay for retirement benefits, further research is needed to improve performance and this report offers one such method of evaluation.

By utilizing some of the most recent financial data available, this report attempts to identify program governance characteristics that positively impact pension performance. Performance is measured using the funded ratio of a program or the measure of current assets compared to liabilities. The tested model is a combination of three main governance characteristic variables (the presence of an investment council, the total number of program board members, and the percentage of board members that are program beneficiaries) and several other independent variables such as total program members. The model has been tested using an OLS and Mixed Effects regression analysis.

The regression estimates provide interesting but inconsistent results. In regards to the governance characteristics, only the presence of an investment council has been shown to be significant over both models. The presence of an investment council raises a programs funded ratio by more than 7 percentage points in both models. In regards to the remaining independent variables, of particular note are the estimates on the availability of Social Security coverage to program participants. In the OLS analysis, the estimated impact is a negative 0.411 percentage points while the Mixed Effects impact is 2.211 percentage points. Although neither is statistically significant, the divergent nature of the estimate should be something that is worth future attention.

By pooling the results over the two models, it is the recommendation of this author that programs at least consider implementing an investment council for their respective programs for the reasons outlined above. Programs should also consider limiting their increases to employee contribution rates as current analysis has shown that a roughly one percent increase in employee contribution rates decreases the funded ratio by one percent. By implementing the appropriate board and program characteristics, public retirement systems at all levels could begin to slow or correct the underfunded problem that has been growing in recent years.

Problem Statement

In 2012, the PEW Center on the States released a report on the fiscal position of state pension plans which concluded that collectively, there is a $1.38 trillion gap between pension liabilities and current funding levels (2012). Although there are states (i.e. Delaware and Wisconsin) that are considered to be in a sound or solid position, quite a few states are in need substantial improvement if they are to meet their current and future obligations. Two such states in poor standing include Illinois and Rhode Island, both of which have less than 50 percent of their current liabilities funded. Kentucky does not fare much better with only a 54 percent funding level. To expand on this problem, states are not the only issue. There are many local or city sponsored public retirement systems that are underfunded as well. In a 2011 Congressional Budget Office (CBO) brief, it was estimated that as of 2009, public pension systems are collectively underfunded between $0.7 trillion and $3 trillion, depending on the valuation method utilized (Russek). The current state of public pension funding is an issue that everybody should be concerned about no matter what state you live in and regardless of whether or not you are or will be a program participant.

The underfunding of public pensions should be a concern for everybody in the United States. The implications of a public entity (state or city) defaulting on its pension obligations would be far reaching. First, there is the impact felt by pension recipients. A default could lead to a reduction in benefit payments or their elimination, depending on the state's constitutional requirements. While unprecedented at the state level, the local level has experienced such an elimination of benefits due to poor fiscal. In 2012, the city of Central Falls, Rhode Island exited bankruptcy proceedings with an agreement to cut its local pension retiree benefits by as much as 55 percent (Russ, 2012). Another example of cities facing looming pension program issues is

Detroit, MI. As reported by Allison Schrager (2011), lawsuits have already been filed on behalf of Detroit pension funds to prevent reduction to their benefits as the city faces bankruptcy proceedings. Second, a default would impact bond investors. Entities obligated to pay benefits could have to redirect funding set aside for bond payments in order to make up for any shortfall. In turn, investors would face reduced or delayed interest and principal payments. Lastly, as cities and states shift funding to pay for pension benefits, other programs and services could suffer from reduced funding. In turn, the citizens that are served by these services would be adversely impacted regardless of their status as a retiree. As outlined here, the implications of underfunding a public pension system could impact not only program participants but also their neighbors and investors.

There are several reasons that have led to the current financial situation of public pension systems: (1) poor pension investment performance, (2) unwillingness of state governments to allocate full pension obligations, and (3) lax or altering pension legislation. Research on the various reasons for the widening gap between state liabilities and pension funding has been successful in bringing to light detrimental activities and isolating problematic programs or systems. Another avenue of research has focused on ways to mitigate the impact of pension underfunding. Included in the research are alternatives to overcome pension underfunding problems via investment strategies or updating a system altogether (i.e. shifting from a deferred benefit retirement system to a deferred compensation system or a hybrid of both). While these avenues of research are important to understanding the problem, much less attention has been given to successful systems.

Opportunities for further research should focus on systems that are meeting and/or exceeding expectations, in terms of funding their retirement systems. In doing so, the

characteristics of these successful systems could be identified and potentially implemented in the states that are lagging. Of explicit concern to this paper, attention will be given to the governance structure of pension program boards and how governance structure and characteristics impact the performance of pension programs. Are there characteristics of program boards that significantly influence their performance? This question will be addressed in future sections of the paper. After performing an analysis of the available data, recommendations will be offered for program considerations. While certain characteristics might be difficult to duplicate (or implement), at least with a roadmap towards success, states could attempt to right the ship that has been off course for far too long.

Literature Review

In 2000, Michael Useem and Olivia Mitchell sought to study the relationship between pension system characteristics and performance measurements. Their initial hypothesis was that certain pension system characteristics and governance policies would directly influence the performance outcomes of the respective pension systems. Ultimately, they would conclude that the direct impact of these variables was not on the performance results but rather on the investment decisions of the pension systems.

The pension system characteristics or governance policies that they examined included: board size, board composition, investment restrictions, independent performance evaluations, asset allocation responsibility of the board, and direct investment decision responsibility of the board. The investment categories considered by the authors included: tactical investment, equity investment, outside investment management, and international investment. Their data was obtained from a series of surveys conducted in 1993 for the Public Pension Coordinating Council

(Zorn, 1994) and a follow up survey from 1996 (Zorn, 1996). The follow up survey provided the authors the necessary data to draw conclusions pertaining to the characteristic influence on investment strategy decisions. Although the data was not discussed in great detail in their article, supporting articles (Zorn 1994 and 1996) attest to the reliability and completeness of the data which tends to indicate sound results.

Through the use of a multivariate regression technique, Useem and Mitchell were able to show that certain pension system characteristics influenced the investment decisions of a program as opposed to directly influencing its performance outcome. The list of variables that were shown to significantly influence investment decisions included: investment restrictions, independent performance evaluations, board composition and board size. For example, independent performance evaluations were shown to negatively impact the tactical investment strategy, have a slightly positive influence on the outside management and international management strategies, and had a significantly positive influence on the equity investment strategy (Useem & Mitchell, 2000). The authors then took their findings pertaining to investment strategies and examined the impact that specific strategies had on actual rates of return.

In the second part of their analysis, Useem and Mitchell (2000) were able to determine that investment strategies could have as much as a two percentage point impact on actual returns on investment. For large pension programs, a two percentage point impact could mean the gain or loss in the tens of millions of dollars. While the results could be of significance for large and small programs alike, the second part of their analysis lacked a detailed explanation of their methods used. In light of these limitations, the impact of their findings as related to the impact of pension system characteristics cannot be overlooked. It is from their research that the basis for the current study was born.

Useem and Mitchell concluded in their article from 2000, that characteristics of pension systems could influence, albeit indirectly, the performance of pension systems. By utilizing some of the same variables that were discussed by the authors, in particular pension board size and updating the data source to more current figures, the relationship between pension system characteristics and performance outcomes can be examined to determine if any of the same relationships still hold true in today. In addition, current data would include measurements from a significant period spanning an economic recession the likes of which have not been encountered for several decades. The significance of the recession should be considered and the impact that it could and did have on pension systems should not be overlooked.

Although most private systems are set up in different program styles than that of public systems (i.e. deferred compensation vs. deferred benefit), there has been a migration in recent years by public systems to take on more characteristics of the private sector. Even if private pension systems are different than public, a lot can be learned by examining studies that focus on the private systems; one such example is a study completed by Ippolito and Turner in 1987. Using data available from the U.S. Department of Labor from 1977-83 (more specifically, 5500 Annual Report data) the authors examined the different investment strategies and the actual rates of return that various plans realized during the specified time period. One of the characteristics that they focused on was the investment strategy utilized by the private pension programs. Their results are important because they found that investment strategies do in fact influence the rates of return. For example, plans that implemented a stock trading practice or strategy saw a decrease on their rates of return by approximately 60 basis points relative to plans that did not implement the same strategy (Ippolito & Turner, 1987).

These investment strategy results from Ippolito & Turner should be considered by public pension systems as they could be a significant factor behind recent performance measurements. That is, how a fund invests its assets should be accounted for in a model assessing pension characteristics. A plan with heavy stock investments might behave differently or see different performance results when compared to plans invested primarily in real estate or short term investments.

In the wake of the financial recession of the mid-late 2000's, the implications on possible investment strategies by pension systems should be examined. The strategies that they have implemented in recent years could have a significant impact on the current rates of return. Some 17 years after Ippolito and Turner's study, the same relationship could still hold significant. By pulling data from Boston College's Center for Retirement Research, the investment strategies of individual public pension systems could be deduced and evaluated against the respective performance measurements of each system. While Ippolito and Turner's study was of private pension systems, the results can be applied to the public system debate given the current move of public systems to adopt more private system modeling.

A final paper that should be considered when examining the influence of a pension programs' governance structure is David Hess' 2005 article, "Protecting and Politicizing Public Pension Fund Assets: Empirical Evidence on the Effects of Governance Structures and Practices". One substantial finding from this report pertained to the influential power of the pension board members' investment expertise level. Specifically, Hess (2005) found that investment performance was negatively impacted when the board made asset allocation decisions. This would indicate that pension board members do not hold the necessary expertise to make investment decisions on behalf of the programs they represent. This finding is

significant in relation to the current study as roughly 65 percent of the pension boards used in this study have an investment council making investment decisions. This will be explained and expanded in later sections.

A second significant finding in Hess' paper was that the composition of the board will significantly impact the programs' performance. More specifically, the percentage of board members that are appointed or elected to their position and by whom they are chosen significantly influences pension performance. Hess (2005) found that board members elected by plan members improved the overall plan performance. These individuals appear to be capable of preventing the government misuse of plan assets. Hess' results are significant and should not be overlooked. Although other authors have provided significant findings and have laid the framework for present research, Hess's findings not only expand on these prior works but do so using a more current data source. His data was obtained from a series of state and local pension system surveys conducted by the Government Finance Officers Association and the Public Pension Coordinating Council between the years of 1990 and 2000 (2005). The analysis below pulls on prior research for guidance while utilizing the most current data stream available pertaining to state and local pension programs to address whether or not governance characteristics influence pension performance.

Research Design

Variables & Model

Measuring the performance of a public pension program is a topic that has generated much debate. Useem & Mitchell (2000) measured performance based on actual rates of return while others, Munnell et al. (2011), have used program funded ratio as the basis to measure

performance. A program that can isolate the characteristics that improve performance and can adequately integrate them in to their own program could potentially reap the benefits of improved performance and stability. The intent of this paper is to present an analysis of the available data and isolate possible pension characteristics that impact performance. In turn, program managers and politicians can assess their respective programs and make changes where potential opportunities might lie.

There are several analytical tools that could be used to aid in the research related to pension program characteristics. Ordinary Least Squares (OLS) and Mixed Effects Logistic (ME) regression models are two such examples and will be implemented to perform the analysis in the following section. These modeling systems require identification of a dependent variable and a list of explanatory variables. The dependent variable, or performance measurement, has been identified as the funded ratio of a program. The funded ratio is determined by dividing a plan's assets by its obligations or liabilities. In a report from the U.S. Government Accountability Office (2008) it was indicated that a pension plan would be at risk of default if the funded ratio was less than 80 percent funded. In terms of performance, a program can not only use the 80 percent threshold to measure their stability but also as a point to measure how much of an impact their decisions have on their funded ratio. That is, are decisions being made that will increase or decrease their funded ratio and how much of an impact will the decisions have on the funded ratio?

The next phase is to determine which variables will be included as explanatory variables for the regression model. Of particular concern is the potential impact that pension program governance characteristics have on the performance of the programs. Therefore, the specific governance characteristic variables that will be included are: (1) the number of board members

for a given program, (2) the number of board members that are actually participants of their program, and (3) whether or not there is an investment council present to make investment decisions. It is possible that specific characteristics of the board members (i.e. how they were elected, age, financial qualifications) could be included as well. However, the limited availability of this information prevented their inclusion in the analysis. Table 1 below outlines the three target variables and the expected impact of each on the model.

Table 1. Target explanatory variables and expected impact

Variable	Description	Expected Impact
totbrd	Total board members	Negative
prctparticpbrd	Percentage of active board members in the program they serve	Positive
invcncl	Designates the presence of an investment council	Positive

The coefficient of the total board members variable is expected to be negative because as more members are added, there are more opinions and ideas that must be weighed by the board. In addition, there could be additional political pressures applied on board members to appease a group or individual that got them elected or appointed. In this case, by listening to others, their decisions could be swayed to the detriment of the pension program. Rather than use the total number of board members covered by the programs that they serve, this model considers the percentage of board members. This is due to the fact that the dependent variable is measured in percentages. It is expected that as the percentage of board members that are current program participants increases, there will be a positive impact on the funded ratio. Prior research has indicated that when board members are plan participants they have more at stake in the plans success compared to a non-participant (Munnell, 2011). Covered board members have a vested interest to see the program prosper and stay adequately funded because they will reap the

benefits from their decisions. Finally, the presence of an investment council is expected to have a positive impact on the funded ratio. While some board members might have the training to make financial or investment decisions not all have the same aptitudes. By taking the investment decisions out of their hands it allows them to instead focus on other issues (i.e. determining employee contribution rates). An investment council can devote all of their attention to making the most financial sound investments decisions without having to worry about other issues or appeasing political whims. In turn, sound investment decisions should lead to a higher funded ratio.

In addition to the target governance variables, the following list of control variables will also be considered: total number of program participants, whether or not program participants are covered by social security, annual required contribution (ARC) rates, and the jurisdiction of the programs (state vs. locality). The table below provides a description of the variables and the expected impact of each on the model.

Table 2. Additional explanatory variables and expected impact

Variable	Description	Expected Impact
members	Total number of program member	Negative
Sscov	Designates whether program members are covered by Social Security	Positive
Arc	Annual Required Contribution (in thousands of dollars)	Negative
jurisdiction	Designates whether the program is a state or local program	Positive
prct_eecrate	Percentage of employee pay paid in to a program	Positive

The variables expected to have a negative impact on the funded ratio are the total number of program members and the annual required contribution rates. As a program grows, logic would suggest that the funded ratio might increase; more people equals more money coming in. However, there are a few explanations to counter this logic. First, if the program is growing, it could be from non-contributing members or retiree beneficiaries. Additionally, as programs grow, there are increased future liabilities which require additional funding in order to cover pension payments. If programs do not increase their funding methods in order to cover the additional liabilities, as the liabilities grow the funded ratio will decrease. The annual required contribution (ARC) is an actuarially determined amount that must be contributed by employers, in this case localities and states. The ARC is set to not only fund current liabilities but also future liabilities. Since ARC payments are paid by governments, their budgets must reflect the need to make good on the ARC payments. As ARC increases, additional funds must be allocated by governments to cover the increasing costs. In turn, if they increase too much or to fast, there would likely be political unwillingness to contribute more than in previous years to fund the ARC. It is for this reason that the expected impact of the ARC variable is negative.

The variables expected to have a positive impact on the funded ratio are whether or not program participants are covered by social security, the jurisdiction of the program, and the employee contribution percentage. The jurisdiction variable indicates whether or not a plan is operated at the state level or the local level. It is anticipated that the larger state managed plans would have a better or higher funded ratio due to the presence of additional resources (monetary or not) that small cities lack. Therefore, the estimated impact should be positive signifying that a state plan would have a positive impact on the funded ratio. The employee contribution percentage measures how much of their pay a public employee must contribute towards the

retirement program. It is expected that as this rate increases, the funded ratio would be positively influenced. In most programs, all employees pay the same rate. Therefore, by increasing the required contribution percentage, a plan would bring in more money and therefore see gains on their funded ratio. The final variable indicates whether or not program participants are covered by Social Security. It is expected that if plan participants are covered by Social Security, the plan could offer a reduction in future benefits to employees as Social Security payments would supplement their retirement payments. As such, future liabilities would begin to decrease. As a result, the funded ratio would improve with lower future liabilities.

The final variable is a variable to measure the impact of time or year. The data includes measurements for the years 2002 through 2009. Measurements from 2001 have been exlucded as the base year for analysis. Given the recent economic recession, the time variable is expected to have a negative impact on the funded ratio. That is to say for each year beyond the base year, the funded ratio is expected to decrease by a given percentage to account for the economic and financial instability in the country. By combining the list of dependent and independent variables with the variable for years, the regression model is as follows:

(1) $$\text{actfundratio} = \text{constant} + \beta_1 * \text{totbrd} + \beta_2 * \text{prctparticpbrd} + \beta_3 * \text{invcncl} + \beta_4 * \text{members} + \beta_5 * \text{sscov} + \beta_6 * \text{arc} + \beta_7 * \text{jurisdiction} + \beta_8 * \text{prct\_eecrate} + \beta_9 * \text{year} + \varepsilon$$

Data

All data utilized in this analysis has been collected from the database Center for Retirement Research at Boston College (2013). This database has annual data from 2001-2009 related to state and local pension/retirement programs for all 50 states and select localities. Minor manipulation of the variables has occurred as outlined in the previous sections.

Table 3 below provides the summary statistics from the analysis:

Table 3. Summary statistics

Variable	Mean	Std. Dev.	Min	Max
Funded Ratio	84.337	16.613	19.1	147.7
Total Board Size	9.884	3.450	1	20
Percentage of Board Covered by Plan	56.546	23.070	0	100
Total Members	181255	231099	3246	1631769
Annual Required Contribution (ARC)	452579	704093	0	7242802
Employee Contribution Percentage	5.668	2.872	0	17.25
N = 958				

Funded ratio, percentage of board members that are plan participants, and employee contribution percentage are all measured in percentages. Total board size and total program members are both measured as their actual values or numbers. ARC is measured in thousands of dollars. The two figures that should be addressed are the minimum values of zero for ARC and employee contribution percentages. These are actual values and not omissions by their respective programs. For at least on measurement there were programs that did not require a set percentage of required employee contribution nor was an ARC established either actuarially or by statutory regulation.

The dummy variables included measuring the presence of an investment council, whether or not program participants are covered by social security and whether a program is operated by a state or city have all been reported in percentages. See Tables 4 -6, respectively, below.

Table 4. Percentage of programs with and without an investment council

With Investment Council	65.19
Without Investment Council	34.81
Total	**100.00**

Table 5. Percentage of programs with and without members covered by Social Security

With Members Covered	75.40
Without Members Covered	24.60
Total	**100.00**

Table 6. Programs that are and are not state managed

Are not state managed (locally managed)	15.08
Are state managed	84.92
Total	**100.00**

Results & Analysis

The regression methods utilized for this paper included Mixed Effects and Ordinary Least Squares modeling. The computer program *Stata* was used to compute all results and conduct all tests during the data analysis phase. The analysis began with first testing to determine whether a fixed effects model or mixed effects model was most appropriate. Based on the Hausman test results, the mixed effects model was indicated to be most appropriate. The first regression that was computed using the previously defined model (1) was a Mixed Effects regression analysis. The results of this analysis can be found in Appendix A.

The main independent variables returned results as predicted previously in Table 1. However, the only significant estimate was the presence of an investment council. The generated coefficient indicates that when an investment council is present the funded ratio is increased by 7.219 percent compared to the base year of 2001. This result supports the notion that investment councils play an important role in the performance of a public retirement system. Systems that do not currently have an investment council may want to consider implementing one in the future.

Although not significant at any level, the remaining target variables did return results as expected or that have the expected impact on the funded ratio. As the number of total board

members increases, the impact on the funded ratio is negative signifying that as boards get larger, the overall funded ratio decreases. As the percentage of board members that are active participants in their retirement systems increases, the funded ratio is positively influenced. This relationship would support the theory that since active program participant board members have a stake in the program performance, they would make decisions to secure their future benefits. That is, since they have a vested interest in the fund performance, they would more closely monitor its performance, including the funded ratio. Again, since both variables are not significant, the magnitude of their impacts cannot be expanded upon at this time.

All remaining independent variables, except members covered by Social Security, returned significant mixed effects results. Of particular importance are the impacts of the jurisdiction of a program and the percentage rate of employee contributions. Both of these results were not only significant but they were in the opposite direction as originally hypothesized. The impact of jurisdiction was indicated to be negative at -10.05. This result indicates that when a public retirement system is managed at the state level, the impact on the funded ratio is decreased by 10.05 percentage points. Although the jurisdiction of most pension plans cannot be changed, this result should highlight the negative impact that state governments have on the performance of pension programs. Rather than being able to allocate additional resources to program management, there is the potential that a states increased size and capability is a hindrance and not a benefit. Even though the variable measuring the impact of members covered by Social Security was not significant, it did return a result with a positive coefficient as predicted. While nothing can be concluded regarding the magnitude of influence, it should be noted that the presence of a program to supplement retirement payments had a positive impact on the funded ratio.

The second regression tool that was utilized to examine model (1) was Ordinary Least Squares. The OLS regression results can be found in Appendix B. All three target independent variables returned significant estimates. The impact due the presence of an investment council on the funded ratio is an increase of 7.841 percentage points when an investment council is present. Like the Mixed Effects results, programs should consider implementing an investment council if they have not already done so given the potential positive performance results. In terms of the total board members and percentage of board members that are program participants, the results not only matched the predicted impacts but are now significant. For each additional board member added, the funded ratio decreases by 0.506 percentage points. When the percentage of covered board members increases by one percent the funded ratio increases by 0.0626 percentage points. While governments may not want to consider increasing the board size of a program, they should however, consider adding members that have a vested interest in the performance of the program.

As was the case with the Mixed Effects results, the only non-significant independent variable was the presence of members being covered by Social Security. It cannot be said with any degree of certainty what the magnitude of impact is estimated to be from members being covered by Social Security but it can be generalized that there is a negative impact to the funded ratio. This result was different than originally hypothesized and contradicts the Mixed Effects results. The OLS estimate signifies that supplemental programs actually hinder the performance of the retirement system rather than boost the performance results.

In both models the estimates for the time variables are significant. In general, any year beyond the base year of 2001 has a negative impact on the funded ratio. The estimates in the Appendices represent the percentage decrease in funded ratio for each respective year. For

example, the OLS estimate for year 2008 is negative 13.50. This signifies a decrease in the funded ratio by 13.50 percentage points compared to the base year of 2001 for any program measurement from 2008. While not explicitly outlined previously, this result was expected given the recent economic crisis and recession during the middle to late 2000's.

Conclusion

Fact: Public pension and retirement systems are significantly underfunded. There is some discrepancy as to what the true magnitude of the actual unfunded liability is but it can be agreed that it is growing year by year. Previous research has been successful in identifying the cases of being underfunded but more research is needed to help get these systems out of the hole they have dug for themselves.

One approach towards improving the future of the public retirement system is to examine the past performance of programs and to implement the characteristics that have a positive impact on performance. Although financial and demographic characteristics are important to dissecting performance so too are program governance characteristics. By utilizing the most recent data from the Center for Retirement Research at Boston College, OLS and Mixed Effects models have been generated to try and identify governance characteristics that programs should consider implementing. The results of the current analysis signify that public retirement systems should investigate the addition of an investment council to make investment decisions. For those programs that already have an investment council present, their funded ratios are increased by over 7 percent compared to those that do not have their own investment council. While the results of adding additional board members and allowing board members to participate in the retirement program were mixed, these characteristics should not be overlooked. With further

model specification and the use of data beyond 2010 as the information is reported, public retirement systems should be able to identify the characteristics that most greatly influence performance. Public systems at all levels need to be carefully examined and consider all options if the underfunded problem is ever going to be addressed and curbed.

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Appendix A. Mixed Effects regression results modeling effect on account funded ratio

N = 958		
VARIABLES	Estimates	(std. error)
Total Board Members	-0.426	(0.417)
Percentage of Board Covered by Program	0.0432	(0.0594)
Investment Council	7.219**	(2.831)
Total Program Members	1.21e-05**	(5.67e-06)
Members Covered by Social Security	2.211	(3.226)
Arc	-1.76e-06**	(7.85e-07)
State or Local Program	-10.05***	(3.667)
Percentage of Employee Contribution	-0.814***	(0.306)
	0	(0)
2002	-5.488***	(0.890)
2003	-9.253***	(0.888)
2004	-11.39***	(0.886)
2005	-13.12***	(0.893)
2006	-13.31***	(0.900)
2007	-12.06***	(0.905)
2008	-14.72***	(0.916)
2009	-19.31***	(0.936)
Constant	106.2***	(6.365)
Number of id	112	

*** p<0.01, ** p<0.05, * p<0.1

Appendix B. OLS Regression results modeling effect on account funded ratio

N = 958		
VARIABLES	Estimates	(std. error)
Total Board Members	-0.506***	(0.171)
Percentage of Board Covered by Program	0.0626***	(0.0228)
Investment Council	7.841***	(1.059)
Total Program Members	2.87e-05***	(3.86e-06)
Members Covered by Social Security	-0.411	(1.312)
Arc	-8.40e-06***	(1.29e-06)
State or Local Program	-11.41***	(1.208)
Percentage of Employee Contribution	-1.192***	(0.214)
2002	-5.673**	(2.253)
2003	-9.212***	(2.194)
2004	-11.14***	(2.091)
2005	-12.35***	(2.124)
2006	-12.51***	(2.098)
2007	-10.80***	(2.096)
2008	-13.50***	(2.098)
2009	-17.25***	(2.166)
Constant	109.9***	(3.143)
R-squared	0.301	

*** p<0.01, ** p<0.05, * p<0.1