Approved: March 15, 2000
Date

MINUTES OF THE HOUSE KANSAS 2000 SELECT COMMITTEE.

The meeting was called to order by Chairperson Kenny Wilk at 1:30 p.m. on January 27, 2000 in Room 526-S of the Capitol.

All members were present except: Representative Gene O'Brien - excused

Committee staff present: Julian Efird, Legislative Research Department
Gordon Self, Revisor of Statutes
Janet Mosser, Committee Secretary

Conferees appearing before the committee:
Lawrence Kochard, Assistant Professor of Finance, Univ. of Virginia and member of the Virginia Retirement System Board

Others attending: See attached list.

Chairperson Wilk recognized Lawrence Kochard, Assistant Professor of Finance, Univ. of Virginia and member of the Virginia Retirement System Board, to address the committee. Dr. Kochard provided an overview of defined benefit and defined contribution systems, the advantages and disadvantages of a defined contribution system, and transition issues to consider (Attachment 1).

Questions and discussion followed.

Chairperson Wilk informed the committee that he, along with Representative Horst and Representative Sharp, met with members of the Executive Board of the State Historical Society about **HB 2605** and believe they have reached a compromise. A balloon is being prepared.

Chairperson Wilk adjourned the meeting at 2:38 p.m.

The next meeting is scheduled for January 31, 2000.

KANSAS 2000 SELECT COMMITTEE GUEST LIST

DATE: 1-27-00

NAME	TITLE	REPRESENTING
Don Reser	Lobbyist	S.E.A.K
Dennis Leerendoorn	HR MANAGER	DEPT. OF AGRICULTURE
Trish Heim	Paralegal	SBG
Dale McAllister	Asst. VP	SBG
Roger Franzke		SBG
Keith Haxton	Lobbyist	SEAK
Bob Corkell	HR Director	KSI
Todd P. Hanzlin	Legislative Intern	Rep. Troy Findley
Pat Lehman	Lobbyist	KS Fire Service Alliance
Karl Peterjohn	Exec. Director	KS Taxpayers Network
Mary Beth Green		KPERS
C. David Sommer	Lawyer	VALIC
Rob Woodard	~~KP~~ CIO	KPERS
Andy Sanchez	Lobbyist	KAPE

KANSAS PUBLIC POLICY INSTITUTE
P.O. Box 1946 • Topeka, KS 66601-1946
Ph: 785/357-7709 • Fax: 785/357-7524

January 14, 1999

The Transition from Defined Benefit to Defined Contribution Pension Plans in the Public Sector

Lawrence E. Kochard, Ph.D.

Forward by
Jack Gaumnitz, Ph.D., University of Kansas

About the Author

Lawrence E. Kochard, Ph.D., is the Assistant Professor of Finance at the McIntire School of Commerce, University of Virginia. He also serves as a board member of the Virginia Retirement System and participates in its Investment Advisory Committee. Dr. Kochard's experience includes a broad range of financial consulting for firms such as the Securities Industry Association, SNL Securities, and New Generation L.P., plus the management of corporate finances for the DuPont Co. and Fannie Mae.

Contents

Forward, Dr. Gaumnitz	1
Introduction	2
Review of DB verses DC Pension Plans	3
Advantages of a DC Pension	3
Disadvantages of a DC Pension	4
DC Plans in the Public Sector	6
Transition Issues: Switching to a DC Pension	7
Unfunded pension liability	8
DC Plan for existing employees	10
Mandatory or optional DC plan	10
Decision between DB and DC irrevocable	11
Vesting terms	12
Investment options and constraints	12
Hybrid plan	17
Employee education	18
Payout policy	20
Conclusion	21

Forward

By Dr. Jack Gaumnitz
Professor emeritus of the School of Business, University of Kansas.

"Freedom is the will to be responsible to ourselves."
Nietzche, Twilight of the Idols, 1888

"True individual freedom cannot exist without economic security and independence."
Franklin D, Roosevelt, message to Congress January 11, 1944

"The greatest gift… was the freedom of the will with which intelligent creatures are endowed."
Dante, The Divine Comedy, 1321

These quotations indicate a dilemma often faced by legislative bodies in enacting laws that on the one hand preserve a freedom of choice in our society while at the same time maintaining that freedom for the general populace by providing for economic security and independence. Such is the challenge faced today by legislatures in determining the proper role for the government in providing for its own employees. This challenge is becoming acute in the retirement area where significant changes are and have occurred in retirement programs for public pensions. In general terms, in one classification, the opposing forces can be divided along lines of defined benefit versus defined contribution plans.

Private industry for many years has offered both types of plans but in recent years they have heavily favored the defined contribution approach to retirement planning for their employees. In order to meet competition from the private sector and better retain employees, several states have opted to offer defined contribution plans to some or all of their employees. Given the provisions that usually accompany defined contribution plans, however, the movement into these types of plans is not without controversy especially in light of the economy security responsibility to its employees that is considered the province of government.

To sort out these diverse and often opposing arguments Professor Lawrence E. Kochard has written a comprehensive and well-balanced paper that explores the various issues surrounding defined benefit (DB) and defined contribution (DC) plans, and their implications for public retirement systems. Professor Kochard's treatise is especially useful in that he provides an excellent historical context for viewing the differences between DB and DC plans. He proceeds to discuss trends in DB and DC plans, outlining good and bad points of each approach, makes recommendations in may instances based on the experience of others, and ends with a discussion of ways to educate public employees about the new opportunity in retirement planning. While agreement with some of his conclusions is open for discussion, Professor Kochard has provided an excellent analysis in easy readable form of an important topic for your consideration.

Finally, Professor Kochard has given ample evidence of the experience of other states in providing various retirement options to their employees. This serves as a very useful blueprint and/or path for others to consider in addressing alternative retirement plans. His discussion easily supports the old adage: *Be not the first by which the new is tried, nor the last to lay the old aside!*

Introduction

One of the most exciting trends occurring at public retirement systems around the country is the increasing popularity of defined contribution pension plans. This transformation has been occurring at private retirement systems for twenty-five years, ever since the adoption of the Employee Retirement Security Act in 1974. According to the U.S. Department of Labor, the total number of participants in private-sector defined contribution plans has increased from 16 million in 1978 to 48 million in 1995, with the value of the assets in these plans increasing from $104 billion to over $1.3 trillion over this time period. According to Clark (1999), the portion of full-time workers at medium to large private firms participating in defined contribution plans increased from 45% in 1988 to 57% in 1997, while the participation in defined benefit plans decreased from 63% to 50% over the same period.

Alternatively, only 9% of state and local government employees participated in a defined contribution plan in 1994. Much of the growth in defined contribution plans in the private sector is attributable to the introduction of 401(k) accounts in 1982. In the public sector, the principal defined contribution alternatives are 401(a) and 403(b) plans. Although only a small fraction of public sector retirement plans are currently defined contribution plans, a number of plan sponsors have either switched or are considering a switch to a defined contribution plan. In 1997, Michigan became the first large system to allow their public employees to have a defined contribution type pension plan. In addition, a number of smaller sponsors have defined contribution plans and a number of other large systems are considering the switch (e.g., Florida).

A number of things can be done to help ensure a smooth transition from a defined benefit to a defined contribution pension plan.

The purpose of this paper is to review and analyze the issues involved with switching from a defined benefit to a defined contribution pension plan. A number of things can be done to help ensure a smooth transition between the two systems. The paper reviews other public and private DC plan experiences and discusses some of the concerns that may arise with a DC pension system. The recommended DC structure and transition approach attempts to draw on others' experiences and pension constituents' concerns to design a DC plan that will be an improvement over the current DB plans and that is attractive to all parties.

Review of Defined Benefit versus Defined Contribution Pension Plans

In this section I review the differences between defined benefit (DB) and defined contribution (DC) pension plans and briefly discuss the pros and cons of each alternative. This discussion will help provide the justification for certain characteristics of a DC plan.

The average public pension plan currently has assets of only 92% of their pension liabilities.

A defined benefit pension guarantees a contractually fixed benefit in retirement through the remainder of a retiree's life. The benefit is determined by a formula, usually a percentage of pay multiplied by the years of service. Oftentimes the future benefit is indexed to inflation. The employer's contribution to a worker's plan is the amount necessary to pay the expected future cost of the benefits, based on expected inflation, future returns and actuarial assumptions. The risk that there are sufficient funds set aside and invested to pay benefits to future retirees is borne by the employer, which in the case of public employees is the state or local government. The money is invested in a combination of stocks, bonds, real estate and private investments. If the assumptions are wrong or returns are too low, or the state contributes too little to the pension, then a DB plan can become under-funded, which is a liability of the state. According to Wilshire Associates, the average public pension plan currently has assets of only 92% of their pension liabilities (Mowbray, 1998). Another feature of DB plans is the vesting schedule. Most plans require employees to work at least 5 to 10 years before they are entitled to any pension benefit. Employees not meeting these vesting requirements and who leave their employer will not receive any future pension benefits.

In a defined contribution pension plan, the employer's contribution to a worker's retirement is fixed. This contribution may be tied to the amount that an employee contributes to his or her DC account (with pre-tax dollars). The employee chooses how to invest the amounts set aside by the employer (and their own contribution), and upon retirement may either receive the amount that has accumulated, as a lump sum or purchase an annuity for the remainder of their life. With this type of plan, the employer faces no risk of an unfunded pension liability. Further, the pension benefit is more portable for job switchers, as they can take the accumulated pension amount with them.

Advantages of a Defined Contribution Pension

As previously stated, the dominant type of DC plan in the private sector is the 401(k) account, while in the public sector the plans are 401(a) and 403(b) retirement accounts. According to the American Legislative Exchange Council (Burton and Lathrop, 1999) the benefits for switching to a DC plan from a DB plan are the following:

☐ Greater portability of retirement benefits, giving employees greater freedom to pursue other career opportunities. For example, a recent Buck Consultants survey of firms that switched from

DB to DC found that the second most popular response given for the change was to accommodate employees who wanted the new plan.

☐ Greater flexibility for the employee to choose the investment portfolio that meets their needs.

☐ Ability to pass on pension benefits to their heirs.

☐ Greater choice of distribution option for the employee (lump-sum or annuity).

☐ No future unfunded liability for the taxpayers.

☐ Easier state budgeting, since the pension contribution varies less from year to year.

☐ Improved employee recruiting because of the portability of the pension benefit. For example, Mayor Dennis Archer of Detroit has said that a DC plan is needed in his city "to attract talented, high-level mayoral appointees, such as deputy mayors, to public service" (Williams, 1999).

☐ No temptation to play politics with the retirement funds by making foolish economically targeted investments.

☐ No temptation to play politics with public employee benefits. Many politicians have been tempted over the years to garner voter support by promising additional public employee benefits without providing funds to pay for the benefits (i.e., by merely increasing the unfunded pension liability). Miller and Jankowski (1998) note that state and local government finance officers have observed asymmetric payoffs from traditional DB plans. When pension investment returns are good the DB plan benefits are inevitably sweetened, but when returns are poor or negative, then the government (i.e., taxpayers) ends up having to pay more.

Disadvantages of a Defined Contribution Pension

There are several disadvantages of DC plans that have been discussed by other economists and pension analysts. Understanding such criticisms will allow us to help design a better DC plan, which is popular with all pension constituents and therefore, is more likely to be adopted.

The most common argument directed against DC plans is that employees are not sophisticated enough to make their own investment decisions. Bodie (1990) states, "the array of investment choices offered by financial institutions and markets often bewilders the ordinary citizen who is untutored in the fundamentals of finance." A 1993 survey from Merrill Lynch found that two-thirds of the respondents wouldn't even guess the level of the Dow Jones Industrial Index and that most respondents overestimated the unemployment and inflation rates. This criticism can be addressed in the design of the DC plan. As discussed below, prudent and effective investment vehicles -- like index funds -- are widely available, easily understood

methods for entering the equities market. There are also an ample number of private sector financial planners who would be quite happy to offer their professional expertise to new DC participants.

Further, there is evidence to suggest that DC investors are more sophisticated than some analysts suggest. There are large incentives for individuals to prudently manage their own retirement assets. The average worker has the incentive to become well informed, and the state can help provide the information and resources for their employees to become "better investors". In fact, a worker has more incentive to maximize his or her own retirement assets than do the overseers (trustees and investment staff) of the DB pension fund. Some pension funds have had a history of making politically motivated investments and have had trouble beating the passive low-cost investment strategy of matching an index such as the S&P 500.

Another criticism of DC plans is that the risk of investment losses is shifted from the employer to the employee and that employees are ill suited to bear these risks. Bodie argues that such arguments are misguided because workers can choose to invest their DC funds in investments that have little or no risk. The DC plan should be structured in such a way to address this concern with a variety of investment choices.

Others argue against DC plans that allow workers access to their funds prior to retirement, leaving such workers with little or no resources during retirement years. Basset, Fleming and Rodrigues (1998) found that when pension assets are withdrawn in a lump-sum prior to retirement, only 28% of these recipients rolled over the withdrawn funds into another tax-qualified savings plan. A 1998 study by Hewitt associates found that 57% of employees who left their firms chose a lump-sum payment instead of rolling the amount into another plan (although this was an improvement over the 63% that Hewitt found in a 1993 study). A 1997 study by EBRI found that 50% of workers rolled their distribution into an IRA or their new employer's plan. Poterba, Venti and Wise (1996) find that the incidence of rolling-over distributions increases for older workers. They find that while only 48% of 35 to 44 year-olds roll-over the lump-sum distribution, a much higher 73% of 55 to 64 year old workers roll-over the DC assets when changing jobs. This is significant, since presumably the older workers have much larger amounts in their DC accounts. Samwick and Skinner (1998) point out that workers can spend 50% of the DC lump-sum received when switching jobs and still receive retirement income equal to that under a DB plan. Although some studies suggest the risk of employees prematurely spending all their retirement assets may not be a serious problem, this concern should still be considered when the designing the DC pension alternative.

"Longevity risk" is another concern that Bodie associates with DC plans. This is the risk that upon retirement the employee takes a lump-sum distribution and outlives their resources (some people may underestimate the number of years they will live). The employee could choose to purchase an annuity contract that pays a constant amount until death. However, Bodie notes that the market for such contracts is affected by an adverse selection problem. People with longer

"Longevity risk" is another concern that Bodie associates with DC plans.

expected lives would opt to purchase these contracts, while those with shorter lives will take the lump sum (i.e., self insure). This suggests that annuity contracts are overpriced, causing fewer of these contracts to be purchased. Friedman and Warshawsky (1988) find empirical evidence suggesting that annuities are overpriced to individuals. Again, this problem should be considered in the design of the DC pension plan.

Much of the criticism against converting public DB plans to DC plans comes from public employee unions. For example, the American Federation of State, County and Municipal Employees have an analysis of defined contribution plans available on their Web Page (Defined Benefit vs. Defined Contribution Plan, dated 11/6/97) detailing many purported weaknesses of DC plans. Other groups tending to oppose the movement to a DC plan include public pension trustees and staff. Gary Findlay, Executive Director of the Missouri State Employees Retirement System, has argued recently in a recent issue of *Government Finance Review* that defined benefit plans are preferable to DC plans. Such opposition must be recognized for DC transition to proceed smoothly. A model case can be found in Montana, where legislation recently passed (1999) allowing a DC option for state employees. The bill passed with bipartisan support and most significantly, with the support of The Montana Public Employees Retirement board and the Montana Public Employees' Association (Heffelfinger, 1999). The approach taken by Montana should serve as a model for other states.

Defined Contribution Plans in the Public Sector

As previously mentioned, there has been a trend in the private sector to move from DB to DC pension plans. Papke (1996) compares private employer pension plans offered in 1985 to those offered in 1992 and found that DC plans have been substituted for DB plans. The trend toward DC plans that started in the private sector has recently started to catch on in the public sector. According to Anand (1999), a recent General Accounting Office report found that 21 state retirement systems had contemplated switching from DB to DC plans. The state of Michigan is the largest state to offer a DC option. The Michigan legislation required that all state employees (excluding teachers) hired after March 31, 1997, participate in a DC pension plan. Existing state employees who participated in the DB plan were permitted to make an irrevocable decision to opt out of the DB plan and into the DC plan prior to April 30, 1998. In addition to Michigan, Nebraska has had a DC plan for its state employees since 1964, and West Virginia has had a DC option for teachers since 1991 (see Burton and Lathrop, 1999).

Washington State offers a hybrid DB/DC plan and the State of Indiana offers a DC supplement to the DB plan for their teachers (Fore, 1999). Wisconsin was the first state to offer a hybrid plan. Wisconsin public employees hired before 1981 receive the higher of payments from a DB plan or a DC-type benefit that is based on the returns from a fund managed by the state Investment Board. These investments are allocated approximately 60% to equities and 40% to bonds (Darby, 1995). Employees hired after 1980, receive the higher of the two payments at retirement, but the DC returns are capped at 5% per annum.

Washington state and Wisconsin have established "hybrid" DB/DC plans.

Although this plan addresses some of the concerns of a DB and DC plans, it has created new problems. For older employees, the state is paying out more than either a DB or DC plan because the state is always paying the greater of the two benefits. For newer workers, the 5% cap has cost them the sizeable gains in the market over the past 17 years, making the capped-DC option rarely attractive. Darby reports that only 15% of Wisconsin employees receive retirement benefits based on the DC option and these employees were likely the older pre-1981 hires. A recent column by Holden and Spratlin (1999) in the *Wisconsin State Journal* has urged their state legislature to lift the cap and make the Wisconsin retirement system a pure DC plan.

The Washington state hybrid plan differs from the Wisconsin plan because it does not offer the greater-of-formula. Instead, Washington gave teachers the opportunity in 1997 to forfeit 50% of their eventual DB pension benefit and, in turn, receive all of their employee contributions plus the actuarial value of the defined benefit they were forfeiting. By the end of 1997, 70% of the eligible employees elected to opt for the hybrid DB/DC plan and as of 1998, there were 35,000 participants and over $1 billion in DC assets (Miller and Jankowski).

Montana has passed legislation allowing all state employees (state, county, city, university and school employees) to choose a DC plan. This will be phased in by the year 2001. A defined contribution option was recently added for state legislators, and other senior government officials and staff in a number of other states. There are currently ten such states - Arizona, Colorado, Florida, Kansas, Louisiana, Minnesota, North Dakota, Vermont, Virginia and Utah (see Kaller, 1999) that offer such DC plans. In addition, there are a number of local governments and state university faculty that have DC plans available. For example, my employer, the University of Virginia, offers a DC and DB alternative, and I was happy to choose the DC plan. There are a number of other states considering the transition to a DC plan. These states include Florida, Georgia, Illinois, and Kansas.

Transition Issues: Switching to a Defined Contribution Pension

We can see that an increasing number of state and local governments are allowing workers to choose a DC option for their retirement plan. I have also detailed a number of complaints that are voiced about DC plans by public employees, state pension officials and other pension analysts. The remainder of this paper identifies some of the key decisions that must be made when considering the adoption of a DC plan, and recommends certain actions that can be taken to mitigate problems with the transition to a DC plan.

The most crucial decisions pertaining to the transition to a DC pension plan are the following:

- ☐ What should be done about the unfunded pension liability from the existing DB pension system?

- ☐ Should the new DC plan be available for only new employees?

☐ Should the DC plan be mandatory or optional for new employees?

☐ If there is a choice, should the choice between a DC and DB plan for new employees be irrevocable?

☐ Should any vesting terms be imposed on the DC participants, and if so, what should they be?

☐ What investment options should be permitted for DC participants?

☐ Should a hybrid DB/DC plan be offered?

☐ What type of education should be offered to employees?

☐ What type of payout should be permitted upon job switching or retirement?

Each transition issue will be addressed by looking at the experience of other systems and recommendations are made for a DC plan that will mitigate problems associated with the transition.

Unfunded Pension Liability

The transition from a DB to a DC plan is difficult to accomplish if the DB system is currently under-funded. This is noted by Fore (1999) and is borne out by looking at the plans that have converted. The problem with converting a severely under-funded system is that if all existing employees choose to convert to a DC option, then the politicians are forced to finally reckon with the unfunded pension liability and immediately come up with the funds to give to those individuals who choose the DC option. It is much easier to do what politicians have done for years, which is hand out extra benefits today and not worry about paying for them until some time in the distant future. Doing the opposite or finally paying for those goodies given out in the past is not in the self-interest of most politicians. The large infusion of funds needed to pay the DC converters may require a bond offering by the state, which merely transforms the relatively hidden pension debt to a more explicit municipal bond obligation. Actually, there is no economic impact on the state - the unfunded pension liability is equivalent to a bond liability. In fact, both Moody's and Standard & Poor's, the two largest rating agencies, consider the impact of unfunded pension liabilities when calculating the state's bond rating. The impact of transferring the liability to a bond is that it becomes more visible and therefore, less politically popular.

Addressing the unfunded liability of the remaining DB program could be a manageable challenge under other scenarios as well. For example, if few existing employees choose to switch to a DC plan, then tackling the unfunded pension liability can be deferred to the future. Other conversion problems could be ironed out through negotiated payout arrangements for those who opt out of the DB plan – in other words, the cash entitlement for those choosing to rollover their money from DB to DC could be the net present value of benefits, minus that portion which is actuarially unfunded.

Addressing the unfunded liability of the remaining DB program could be a manageable challenge.

The only seriously under-funded public pension plan to convert to DC was the West Virginia Teachers plan, which was 86% under-funded when a DC plan for all new public school employees was established in 1991. According to Nauert and Mowbray (1998) more than 14,000 or 30% of West Virginia's teachers are members of the DC plan. In the more recent transitions and states closest to making a transition, the plans are fully or near fully funded. For example, the DC legislation in Michigan required that the State Teachers fund be fully funded before the teachers would be allowed to switch to a DC option. The unfunded actuarial liability of several billion dollars was not eliminated and the teachers never got to participate in the DC plan.

Alternatively, participants in the much better funded public employees retirement system in Michigan were permitted to switch to a DC plan. The next large system that will likely allow a DC option in the near future is the Florida Retirement System. The Florida Retirement System has assets of nearly $100 billion and has about 600,000 active members and 166,000 retirees. Trager, Francis and SigRist (1999) note that two events helped trigger the State of Florida to pursue a DC option. First, the recent strong equity markets have eliminated the unfunded actuarial liability. The second reason is the state feels they need this option to attract talented employees.

Kaller's (1999) analysis of 28 public pension systems that allow a DC option for certain public employees found that 11 of the DC plans required their employers to pay an additional contribution (an amount above the contribution into the employee's DC account) to the existing DB plan. The additional contribution is used to pay down the unfunded actuarial pension liability. If the unfunded actuarial liability is small enough, such as Montana's approximately 10% liability, then this is an attractive option to handle the liability as opposed to dealing with it upfront with a bond offering. For example, in Montana's recently passed plan there will be a contribution made by employers to the DB plan for employees who participate in the DC plan. If the pension system were grossly under-funded, then the only alternative would be finding a large pool of money in the state (e.g., in Oklahoma it has been suggested that the tobacco company settlement money should be considered), or doing a bond offering. Both of these options are likely to be politically unattractive.

DC Plan for Existing Employees

Of the 28 retirement systems studied by Kaller (all public systems currently offering a choice between DB and DC for all new hires) only three did not permit existing employees the option to choose between the DB and DC plans. These states are Mississippi, New Mexico and South Carolina (these retirement plans are for university employees within the state). The inequity of giving new employees an employee benefit (the right to choose a DC plan) while not granting the same benefit to old employees would seem to create a lot of ill-will on the part of old employees. First, it is unlikely that such a proposal would garner the support of public employee unions when trying to draft and pass the DC legislation. Everything should be done to create legislation similar to Montana's where the public employee's union was a supporter of the bill. Second, even if such a DC law passed, this would likely cause greater turnover among older workers who are unsatisfied with their employee compensation package, which is inferior to the package offered to new hires.

We strongly recommend giving existing employees an option to choose between the DB and DC plans. It may be argued that the DC option shouldn't be offered to existing employees if the unfunded actuarial liability is quite large. This would allow for a more gradual transition to a DC plan. Even in this situation I would recommend allowing existing employees the option to switch. Although there is not much data, two other systems that gave their existing employees the option to switch to a DC plan found a relatively small number switching over. The state of Michigan found that only 7% of its eligible existing employees switched to the new DC plan. Fore (1999) reports that Daytona Beach Community College had only 10% of their existing employees switch to their new DC plan. Therefore, even if the DB plan is woefully under-funded, giving existing employees the option to switch is recommended.

Mandatory or Optional DC Plan

The State of Michigan does not give new public employees the option to choose between a DB or DC plan - all new hires must participate in a DC retirement plan. Many researchers and consultants have noted the adverse selection cost associated with allowing new employees the choice between a DB and DC retirement plan (see Trager, Francis and SigRist and Kaller). Under current DB systems, employees who leave prior to vesting subsidize employees who vest and retire. The money that was contributed into the DB system for these non-vested employees is used to help pay the benefits to retirees. The incidence of non-vesting is quite high - Lathrop and Burton report that 70% of employees in the California Public Employee Retirement System never vest, and Mowbray reports that over half of the employees in the Kansas Public Employees Retirement System are never vested.

If new employees are given a choice, some argue that an adverse selection will result whereby those employees who anticipate leaving in several years will choose the DC plan, while those who anticipate staying until retirement will choose the DB plan. This adverse self-selection could potentially increase the costs to the state. In fact, some consultants recommend not giving employees the choice, but rather mandating a DC retirement plan for all new employees, as in Michigan. However, the overwhelming majority of transitions to DC plans permit new-hires the option to choose between DB and DC. Of the 28 systems studied by Kaller that offered a choice to new employees, only one system, the Minnesota system for university faculty, had an adverse selection problem severe enough to affect the DB funding (although most of the systems reported an adverse selection problem, the plans were too small to affect the larger state systems).

One way to mitigate the adverse selection problem is to adopt similar vesting schedules for both DB and DC plans.

One way to mitigate the adverse selection problem is to adopt similar vesting schedules for both DB and DC plans. Most of the plans with options currently have shorter (or no) vesting requirements for the DC plan. In fact, Florida's proposed legislation would shorten the DB vesting to match the proposed DC vesting terms, a graded six-year vesting schedule. However, shortening the DB vesting schedule requires additional costs. The Sate of Florida estimates the shortened DB vesting schedule will cost the system $85 million per annum (about 50 basis points). Not permitting a choice between DC and DB does move the state more quickly to a DC only retirement system, which is better from the standpoint of a state's future fiscal health and thus, minimize the cost to taxpayers. However, the DC alternative is likely to get much greater support from public employee unions and retirement system officials if a choice is offered. Again, I like to point to the success of the Montana plan (and the Washington State plan) where these parties supported the DC legislation, making its adoption much easier. It is much better to have combined DC and DB systems than no DC option at all. Therefore, unless there is no political opposition to a DC only plan, I recommend giving new hires the choice between a DB and DC plan.

Decision Between DB and DC Irrevocable

Kaller finds that in all but 4 out of the 28 systems she studied, the decision by the new hire between a DB and DC system was irrevocable. This includes the recently enacted Montana legislation, which allows new hires to make an irrevocable decision between the DB and DC systems. The proposed Florida legislation would also require a new employee to make an irrevocable decision between the competing retirement alternatives. A moral hazard problem could arise if workers are allowed to switch back and forth between the two systems. If an employee knows their decision is not irrevocable they could switch back to a DB plan after risky investments in their DC plan produce poor returns. The right to switch back essentially provides them with a free put option, which gives them the incentive to take greater risks. Alternatively, if a worker chooses a DB plan, then the state will not want them to switch in the future, after bad returns, when the DB system may be under-funded. Finally, switching back and forth between a

DC and DB system would create additional administrative costs and burdens that would be borne by the state and taxpayers. These costs can be avoided by allowing employees only one opportunity to decide between the two systems.

Some may argue that a new employee may not have sufficient information to make this sort of decision. This problem can be addressed by providing educational resources to each new employee so that they fully understand the pros and cons of each alternative. Another argument may be that an employee may choose the DC plan, but then circumstances may change or the person's risk tolerance may change as they age, so at a later time they would prefer to be in a less risky DB plan. This problem can be overcome by providing a low risk bond (or even better, an inflation indexed bond) investment alternative that would meet this individual's risk-return profile. Therefore, like Montana, Florida and many other systems, the recommended course would be to allow only one irrevocable decision between DB and DC for any new employee.

Vesting Terms

From the employee's perspective, the greater portability of a DC plan is one of its most attractive features. From the employer's perspective, this will help attract talented employees. However, there has been some concern raised that a DC plan could increase employee turnover and therefore, retraining cost. A review of the economics literature by Trager, Francis and SigRist (1999) reveals little evidence that DB plans reduce employee turnover. Although DC plans are more portable than DB plans (and thus attractive to job hoppers), a DC plan can still include vesting terms in order to induce workers to remain for a period of time.

According to Lathrop and Burton, employees in a 401(a) plan are fully vested in their own contribution immediately and must be fully vested in at most seven years. In Michigan, the employee is 50% vested in the employer's contribution after two years and is fully vested after four years of employment. Montana's recently enacted DC plan has 100% vesting of the employer's contribution after 5 years, and vesting under the DB plan also after 5 years. Florida's proposed DC plan provides an attractive model for structuring the vesting terms. Florida has proposed to have gradual vesting, which commences after one year and fully vests employees at the end of their sixth year of employment. In addition, the DB vesting schedule exactly matches the DC schedule.

Having some vesting after only one year will be attractive to talented new hires, but having the vesting terms improve over the following five years is some inducement to stay on the job and should help discourage job turnover. As previously mentioned, having a similar DB vesting schedule will help reduce the adverse selection costs (although a shorter DB vesting schedule will also increase the cost to the state).

Investment Options and Constraints

One of the biggest arguments against DC retirement plans is that the risk of inferior investment performance is borne by the employee. In a DB plan, the risk is borne by the

provider. In a public DB pension plan the state and local government must bear the risk of poor investment returns, which ultimately translates into a risk borne by taxpayers.

Placing investment restrictions on the retirement funds can mitigate the risk of a DC pension plan. Over a long investment horizon, studies have found that a broadly diversified portfolio of equities will outperform other apparently less risky investments, like money market instruments and bonds. Jeremy Siegel (1998) compared the returns (both real and nominal) from a diversified portfolio of equities to bonds and money market type investments from 1802 until 1997. He found that in every 30-year period studied during this time frame, stocks generated a positive real (and nominal) return. Long-term bonds only beat stocks for one thirty year period, namely the period that immediately preceded the Civil War (i.e., long-term bonds outperformed stocks only 0.6% of the time). Stocks have outperformed long-term bonds every thirty-year period from the Civil War to the present. However, looking at only a 5-year period of time, the stock portfolio outperformed long-term bonds 70% of the time. The worst 5-year performance on equities (over the 195 year time period) was a real return of -11%, compared to the worst bond performance of -10%. Over a one-year period of time, the stock portfolio outperformed long-term bonds 61% of the time. The worst one-year performance on equities was a real return of -39%, compared to the worst long-term bond performance of -22%.

A broadly diversified portfolio of equities will outperform other apparently less risky investments, like money market instruments and bonds.

This has remarkable implications for retirement investing. Stocks are not that risky when held over a very long period of time (i.e., 30 years). However, when looking at short holding periods of time (e.g., one to five years) the volatility in stock prices make these investments much riskier than the known payoff on bonds. The risk attributable to bonds is due to the erosion in purchasing power from holding nominal bonds - namely, inflation risk. Shorter-term bonds, like money market instruments, or better yet, inflation-indexed bonds can protect against such risks.

The implication for a DC investor is as follows. When a worker is young (e.g., their 20's) and their retirement is more than 30 years away, it would be advisable to allocate all of their DC assets to a diversified portfolio of equities. However, if the worker is about 60 and hopes to retire in about 5 years or less, then the worker should have a much lower percentage of their DC assets allocated to equity and have more funds allocated to shorter-term bonds. Otherwise, there could be a market crash or bad returns during this short period of time immediately prior to the worker's retirement. The worker doesn't have the luxury of waiting another 20 years until the market recovers since they don't have the ability or desire to work another 20 years.

Another risk that individuals must worry about is future inflation. Over a short time period both bonds and stocks have been shown to be poor hedges against inflation. As previously noted, stocks tend to provide an inflation hedge over longer periods of time. Therefore, the DC participants also must try to protect themselves against inflation, especially over a shorter time period. The U.S. Treasury currently issues inflation-indexed bonds, where the coupon on the bond is adjusted up and down with inflation. This would be an attractive alternative for a DC participant who is looking to retire in several years and is reducing their equity exposure in favor of bonds. At least a portion of the bond portfolio should include inflation-indexed bonds.

Inflation-indexed bonds issued by the U.S. Treasury -- where the coupon on the bond is adjusted up and down with inflation -- would be an attractive alternative for a DC participant who is looking to retire soon.

Financial planners have been giving similar advice to their clients for years -- invest most or all of your funds in a diversified portfolio of equities early in life and increase the allocation to bonds in later years. Siegel (1999) suggests that a conservative investor's optimal allocation would be 90% equities for a thirty year period of time, 61% equities for a ten year period, 42% equities for five years and 25% equities for only one year. A moderate risk-taker would increase his or her allocation to equities to 86% for ten years, 63% for five years and 50% for one year. Perhaps a reasonable limitation would be to limit the equity allocation to 80% for a 55-year-old employee, with the limitation declining to 50% for a 65-year-old employee who is about to retire.

Further, investors should try to protect themselves against future inflation risk. It is likely that employees, acting in their own interest, will generally adhere to these maxims. The provider can (and I will discuss later why it should) provide education to help employees get to the preferred lifetime asset mix. DC investors in the private sector have done quite well over the last several years. Some have leveled the criticism that DC investors left to their own choice will actually be too risk averse. However, a recent survey conducted by the Committee on the Investment of Employee Benefit Assets found that private sector DC participants actually allocated less to fixed income (only 22% of total assets) than the DB assets that were directed by pension officials and staff (28% of total assets).

Despite the fact that individuals are likely to make asset allocation choices that are well suited for their individual circumstances, I still recommend placing certain investment restrictions on their DC assets. To justify the need for restrictions, I return to the moral hazard argument. It is quite likely that some DC plan participants will take a lot of risk with their investments - perhaps allocating 100% to equities for their entire career. Although this strategy may produce the highest returns over a long period of time, it is quite possible that the year or two before retirement a market crash or bad returns could leave the employee with an unexpectedly small retirement nest egg. Pity the poor person who was invested entirely in equities in 1929, and was hoping to retire in 1930. According to the Economist magazine (5/15/99), 10,000 firms had defined contribution retirement plans prior to the 1929 crash. Only 300 defined contribution plans remained in place at the end of the Great Depression. The Economist quotes a pension consultant saying, "it takes very little to go wrong these days before retirees are marching up and down Pennsylvania Avenue, their placards held high and lawyers in two." The moral hazard problem is that, left to their own devices, some employees may recognize that they may be rescued and therefore, take too much risk with their investments. Their perception is that heads, I win, and tails, I expect the state will come and partially bail me out. Therefore, I recommend placing limitations on the amount of risk that can be borne by employees, and that these risk parameters should change as the employee ages and gets closer to retirement.

Left to their own devices, some employees may recognize that they may be rescued and therefore, take too much risk with their investments. Their perception is that heads, I win, and tails, I expect the state will come and partially bail me out.

There are additional restrictions I would advise on the investment options. At one end of the spectrum would be a DC plan that allows each individual to choose any investment available in the marketplace. The above analysis clearly places limits and rules out a number of very risky choices. However, the choices should be restricted even further. Burton and Lathrop correctly note that the two most important characteristics of a successful DC plan are diversification of investments and low investment management fees. Finance researchers and Nobel Prize winners, Markowitz (1952) and Sharpe (1964) have both noted that investors can reduce much of their investment risk by investing in a well-diversified portfolio of equities. Therefore, investments in individual stocks should not be permitted. The employee should be restricted to investing in a portfolio of stocks available from nationally prominent money management firms.

The next thing that can help produce higher returns for employees is to minimize the fees paid to money managers. There are two broad categories of investing; active investing and indexing or passive investing. In the first approach, the manager attempts to select stocks they believe are "undervalued" and will produce high future returns. In the latter approach, the manager merely attempts to duplicate the portfolio of a large basket of stocks (e.g., the S&P 500 index or the Russell 3000 index) that is representative of the entire stock market. The advantage of indexing is the lower fees, which are generally 50 to 100 basis points less than the fees charged by an active manager. The higher fees could be justified if the manager, in fact, delivered higher returns. However, many academic studies have shown that although some managers beat the indexing strategy after the higher fees, on average it is impossible to systematically identify who these managers will be, ex-ante. Therefore, indexing, on average, produces higher returns for the investors.

Higher returns for employees can be achieved when the fees paid to money managers are minimized. Under one example, the retiree who saves 100 basis points per year in management fees can retire with 26% more in assets.

Although 50 to 100 basis points in costs may seem insignificant, the cost to portfolio performance compounds over time. For example, suppose $5,000 is contributed to a retirement plan every year for 35 years. Suppose the return on the DC assets is 12% per year. The employee would receive $2.16 million in 35 years at retirement. Alternatively, suppose the returns were 100 bps lower, because of higher management fees. The 11% return would only allow the retiree to have $1.71 million at retirement. The retiree who saved 100 bp per year in management fees can retire with 26% more in assets. Therefore, I recommend limiting the options to only passive managers who can be negotiated at the lowest possible fees. I recommend having only several choices -- a US indexed equity fund (indexed to either the Russell 3000 or the S&P 500 index), an international indexed equity fund, a bond fund, a money market fund and an inflation indexed bond alternative (perhaps the last two could be combined since they achieve a similar purpose - providing an inflation hedge). Limitations would be placed on the percentage of one's overall funds that could be invested in any given equity fund. In addition, as previously discussed, limitations would be placed on the portion allocated to equities as the employee nears retirement.

Having relatively few and simple investment options runs counter to the trend in the DC industry. The Profit Sharing/401(k) Council of America survey results from 1978 and 1997, find the opposite trend. In 1978, only 4% of the DC plans offered a choice of five or more funds. In 1997, the percentage of firms offering five or more funds had increased to over 87%. However, respondents to a J.P. Morgan survey (Siegel, 1999) found that once you get above 11 or 12 options the participants become confused. According to Siegel, in 1994, the average 401(k) participant had 4.6 investment options. By 1998, the number of options increased to an average of 8.4. The increasing number of choices is likely a response to the barrage of marketing by money managers showing attractive returns in the attractive sector or industry or country de-jour. Instead of trying to pick the next hot fund manager or industry or country, we should focus on

offering several asset categories and minimizing costs. Cutting costs goes right to the bottom line of the retiree's investment nest egg.

The last decision regarding investments is the frequency that employees are permitted to switch their investment allocations. There is no evidence that people are able to time the market and make allocation changes that will improve their return performance over time (despite the convincing stories that are spun on CNBC and internet investment chat rooms). DC asset reallocations should only take place to help manage the risks I have already discussed. Therefore, there is no need to reallocate frequently - certainly no more than once per year. If there are any additional costs associated with more frequent switching, then this should not be allowed. However, there is evidence that such administrative costs are declining and it may get to the point that it costs no more to allow employees to reallocate their balance as frequently as they wish.

Hybrid Plan

Hybrid plans have gotten a lot of attention recently in the private sector. In the private sector, a hybrid plan usually refers to a cash balance pension plan. Cash balance plans are legally considered DB pension plans. There is no investment risk to the employee (and thus, there is risk to the state and taxpayers). The only improvement cash balance systems offer over DB systems is that they allow for greater portability. This gain for newer employees generally comes at the expense of mid-level and older employees. This has created much controversy over the past year as large companies, such as IBM, tried to switch from a traditional DB to a cash balance plan. Unlike a traditional DB pension, participants in a cash balance plan receive detailed individual reports on the amount of assets in their plan. The cash balance in each employee's account grows each year based on annual credits received that are determined as a fixed percentage of annual pay. The Texas Municipal Retirement System is a cash balance system, which according to Owen (1999) is the oldest cash balance plan in the United States. There are 700 municipalities participating in the Texas System. Although the hybrid plan helps address the issue of portability (and is therefore, a superior employee recruiting device than a traditional DB plan), it still exposes the state to investment risks and employees will not participate in the type of investment returns that have been earned over the last few years in the market.

The only improvement cash balance systems offer over DB systems is that they allow for greater portability

Another hybrid plan is the previously discussed Wisconsin plan, where workers receive the higher of the DB benefit or a DC alternative (where the DC investment choices are made by the state). For employees hired after 1980, the DC returns were capped at 5% per annum. This low cap means the DB option will almost always be more attractive, and thus the employees missed out on the good returns over the past 17 years. For older employees the DC returns are uncapped and this exposes the state to a lot more risk than the traditional DB plan.

The most attractive hybrid plans appear in Washington State and Colorado. As previously discussed, teachers in Washington Sate were offered the opportunity to switch from the DB plan to the hybrid plan in 1997. All employees hired after 1996 participated in the hybrid plan. In the hybrid plan, the state makes contributions to a DB pension for the employees, but the employees' contributions are made to a DC plan (unlike the old DB system where both contributions went to the DB plan). The retirement benefits from the DB portion of the plan will be about half of the prior sole DB retirement benefits. The DC funds can be allocated to several investments, which includes several index funds and investing with the Washington State Investment Board, which oversees the investments of the DB plan. The hybrid plan has been politically popular in the State of Washington. The advantage is that the employee does not assume the full investment risk for their retirement funds, and that the state continues to bear some of this risk. Miller and Jankowski also claim that the fees paid by Washington State are low.

Although the Washington State plan is the best hybrid alternative for the public sector, there is still a disadvantage compared to a pure DC system...

Although the Washington State plan is the best hybrid alternative for the public sector, there is still a disadvantage compared to a pure DC system. The state is still exposed to a future unfunded liability, which can be caused by the politics of giving out future unfunded benefits with the DB portion of the hybrid plan. By keeping the DB portion of a hybrid plan there will continue to be future temptations on the part of politicians to give out benefits without having to pay the full amount of the cost at that time. With a DC system any additional benefits given to current employees must be fully funded. Further, the temptation to make foolish economically targeted investments will persist if the DB portion of a hybrid plan is maintained. Moving to a pure DC plan eliminates both of these temptations. The benefit of the hybrid plan is that you eliminate the problem of having a retiree who chose too much risk near retirement and is left with little resources for retirement. However, this problem can be avoided within a pure DC plan by placing the aforementioned restrictions on the investment options and have the restrictions vary with the age of the employee. Although a Washington State hybrid plan is an improvement over a DB only plan, a properly structured DC plan is even better.

Employee Education

Employee education is composed of two areas. First, an initial education program must help provide existing DB plan participants with enough information to make an irrevocable choice between remaining in a DB plan and moving to a DC plan. Second, an ongoing educational program must assist DC participants in their asset allocation decision.

The small number of employees who elected to switch to a DC plan in Michigan suggests that more could have been done to prepare these employees for their irrevocable decision. In response, Montana has provided for funds to help pay for an educational program designed to

help employees better understand the two alternatives. Montana House Bill 79, Section 41, states that in the year 2000, each employee will contribute $10 and the employer will contribute .075% of payroll, to fund an educational program covering the initial choice between the DB and DC plans. Florida also plans to legislate a DC plan that will provide significant funding for the initial education. Given the irrevocability of the decision to be made by existing employees, it is imperative that the state provides the resources to help employees make a well-informed decision. The education must properly address the risks and the benefits of moving to a DC plan. Even after the initial switch, education is needed for new employees who must also decide between a DC and DB plan.

Beyond the education that takes place during the switch and for new employees, there should also be resources made available on a continuous basis to help employees make informed asset allocation decisions.

Beyond the education that takes place during the switch and for new employees, there should also be resources made available on a continuous basis to help employees make informed asset allocation decisions. For example, Montana has legislated that future education needs will be funded by charging employers .04% per payroll dollar. It is widely believed that the average DC investor is naive and unprepared to make good investment decisions for their retirement. Although this is a common criticism against DC plans, there is evidence that suggests this may be a bit of an exaggeration. Mastio (1999) reports that during the market correction of 1998, less than 1% of 401(k) funds were allocated away from equities. This type of long-term thinking, as opposed to panicking, is exactly the advice given by economists and financial planners. Mastio also reports the findings of a 1999 Employee Benefits Research Institute (EBRI) survey, which found that DC participants also tend to reduce their equity exposure as they age, again, as recommended by financial planners. The EBRI survey found that individuals in their twenties allocated an average of 77% of their assets to equities while individuals in their sixties allocated only 53% of their assets to equities.

Thus, while evidence suggests that the average DC participant may be able to make prudent decisions, the employer should still provide the resources to help with the asset allocation decision. There are several vendors who provide on-line assistance that could be useful for this purpose. Financial Engines (founded by Nobel prize winner William Sharpe) and 401k Forum are two companies that provide access to Internet based financial planning and asset allocation assistance. Both services can be purchased by a state to help their employees evaluate the risk-return tradeoffs among the various asset allocations for their DC funds. The state cannot be in the position of making investment recommendations. Neither of these services performs this function, but both allow what-if type of analyses to help employees determine the best allocations for their needs (subject to the aforementioned investment constraints).

Payout Policy

Two concerns about DC pension plans have been raised regarding access to the employee's DC funds. The first concern is that access to funds prior to retirement could cause employees to have few resources during their retirement. The second concern is that retirees who choose a lump sum payout at retirement may underestimate the number of years they need these funds to support their retirement, leaving the retirees without funds near the end of their lives. As previously mentioned, researchers have found that many workers who leave a job with a DC plan will not roll the funds into another tax-qualified retirement plan, incurring a large tax liability and a 10% penalty. As Bassett, Fleming and Rodrigues (1998) note, the choice to spend or invest the funds outside of a qualified retirement plan is not necessarily a bad one. The individual may be using the money for education or investing in a business. Given the individual's desire to act in their best interest, it is likely that these decisions are, on average, best for those individuals. Further, given that these people are younger and no longer employees of the state or local government, the public should be less concerned about what happens in their retirement.

Even if you incur a large tax liability and a 10% penalty for a pre-retirement withdrawal, the choice to spend or invest the funds outside of a qualified retirement plan is not necessarily a bad one.

Alternatively, an existing employee may wish to have pre-retirement access to their pension funds by borrowing against the DC account. Mitchell (2000) finds an increasing trend in the private sector (with 401(k) accounts) toward allowing employees early access to their DC accounts through loans, with the incidence of plans allowing loans increasing from 43% in 1993, to 51% in 1997. Of the plans permitting loans against DC accounts, less than 10% restricted such access to situations involving hardship on the part of the employee (e.g., death or illness of a family member). Permitting early access to funds for existing employees poses a different issue for the public employer. A concern expressed earlier is that public employees who are penniless in their retirement will be unacceptable for government officials and politicians. In this situation, it is likely that politicians will support legislation to give some funds to such individuals. Therefore, a moral hazard problem exists that could cause some employees to borrow against their DC account, spend the money foolishly or on risky ventures and then hope for a bail-out by the state in the future. This type of unacceptable behavior and risk taking will be encouraged and end up increasing the cost to the state. Therefore, despite the trend in the private sector, loans against DC account balances should only be permitted in the case of hardship on the part of the public employee.

Mitchell (2000) finds 91% of 401 (k) plans allowed participants to receive a lump-sum payment at retirement in 1997. Only 27% of 401(k) plans allowed participants to receive their accumulated DC benefit as an annuity for the rest of their life. The concern has been expressed that DC participants who receive a lump-sum payment may underestimate the length of their life

and run out of funds. This concern creates a situation similar to that discussed before - a moral hazard problem. It is quite possible that the government will bail out retirees who run out of money. Anticipating this action, some retirees are more likely to spend too rapidly and make risky investments in their retirement, thus increasing the cost to the DC system. Further, if both lump sum and annuity options are made available by the state, then an adverse selection problem may arise, as previously discussed. Those individuals who expect to live longer are more likely to select the annuity option, thus, increasing the cost of the annuity option to the retiree. Requiring all retirees to select an annuity (several insurance company vendors can be lined up by the state) mitigates the adverse selection problem of offering both a lump-sum and annuity option and reduces the moral hazard costs associated with the retirees choosing the lump-sum alternative.

Conclusion

Many public pension systems are currently debating the merits of transitioning from a defined benefit to a defined contribution pension system. This paper identifies a number of issues that must be addressed in the transition between the two plans. The recommended DC structure tries to address a number of the concerns raised by opponents of DC plans. The proposals should help ease the transition to a DC plan and make the DC plan an attractive pension alternative for public employees in the future.

References

Anand, V., 1999, Pension conundrum: states consider switching to DC plans, Pension and Investments, 4/5/99 pg. 8

Bassett, W., Fleming, M. and A. Rodriguez, 1998, How workers use 401(k) plans: the participation, contribution and withdrawal decisions, National Tax Journal 51, 263-289

Bodie, Z., 1990, Pensions as retirement income insurance, Journal of Economic Literature 28, 28-49

Burton, E. and M. Lathrop, 1999, Modernizing public pension systems: the case for defined contribution plans, American Legislative Exchange Council, Volume 25 no. 3

Darby, R., 1995, New menu for public pension funds, Government Finance Review 12/01/95, 43-48

Employee Benefit Research Institute, Fundamentals of Employee Benefit Programs, Washington, D.C.

Findlay, G., 1997, In defense of the defined benefit plan, Government Finance Review

Fore, D., 1999, Going private in the public sector: the transition form defined benefit to defined contribution pension plans, Pension Research Council, Working paper 99-14

Friedman, B. and M. Warshawsky, 1988, Annuity prices and saving behavior in the United States, Financial aspects of the U.S. pension system, Chicago, U. of Chicago Press

Heffelfinger, S., 1999, Pension reform in Montana: A case study, American Legislative Exchange Council Issue Analysis, July 1999

Holden, K. and J. Spratlin, 1999, State legislature should restore competition in pension program, Wisconsin State Journal 8/26/99

Kaller, D., 1999, Defined benefit vs. defined contribution plan survey summary, State and Local Pension Exchange Web Site

Mastio, D., 1999, Lessons our 401(k)s taught us, Policy Review, Heritage Foundation, June-July 1999

Markowitz, H., 1952, Portfolio selection, Journal of Finance 7, 77-91

Miller, G. and J. Jankowski, Jr., 1998, Public-sector defined contribution plans: lessons from seven governments, Government Finance Review 14, 29-33

Mitchell, O., 2000, New trends in pension benefit and retirement provisions, Pension Research Council, Working paper 2000-1

Mowbray, J., 1998, The nature and contrast of pension concepts, Kansas Public Policy Institute

Nauert, H. and J. Mowbray, 1998, A state blueprint for social security reform, Investor's Business Daily 5/26/98 pg 38

Owen, T., 1999, Cash balance pension plans: will the public sector follow the private-sector stampede?,

Government Finance Review 15, pg 65

Poterba, J., Venti, S. and D. Wise, 1996, How retirement saving programs increase saving, Journal of Economic Perspectives 10, 91-112

Samwick, A and J. Skinner, 1998, How will defined contribution plans affect retirement income?, NBER Working paper 6645

Sharpe, W., 1964, Capital asset prices: a theory of market equilibrium under conditions of risk, Journal of Finance 19, 425-442

Siegel, J., 1998, Stocks for the Long Run, McGraw Hill

Siegel, M., 1999, Can you have too many 401(k) choices, Fortune 139, pg 468

Trager, T., Francis, J. and K. SigRist, 1999, Florida's public pension reform debate: a discussion of the issues and estimates of the option costs, Pension Research Council, Working paper 99-23

Williams, T., 1999, Political Skirmish: Detroit employees allowed to switch to new DC plan, Pension and Investments