NATIONAL INSTITUTE ON
Retirement Security
Reliable Research. Sensible Solutions.

Milliman

Decisions, Decisions:
An Update on Retirement Plan Choices for Public Employees and Employers

By Jennifer Erin Brown, MS, JD, LLM and Matt Larrabee, FSA, EA, MAAA

August 2017

ABOUT THE AUTHORS

Jennifer Erin Brown is the Manager of Research for the National Institute on Retirement Security (NIRS). She joined NIRS in October 2015 and conducts research and analysis on pension and retirement issues. She is also a Tax Policy fellow at the American University Kogod School of Business where she serves as an Adjunct Professor. Previously, she served as an Employee Benefits Law Specialist at the U.S. Department of Labor's Employee Benefit Security Administration where she worked on issues related to corporate transactions, financial products, and the Affordable Care Act. She holds an LL.M. in Taxation and a Certificate in Employee Benefits Law from the Georgetown University Law Center, a J.D. from the American University Washington College of Law, an M.S. in Law & Society from the American University School of Public Affairs, and a B.A. in Philosophy and Criminology from the University of Florida. She is a member of the National Academy of Social Insurance.

Matt Larrabee is a consulting actuary in Milliman's Portland, Oregon office. He has over 20 years of actuarial consulting experience with expertise in pension and retiree medical programs sponsored by governmental and corporate entities. During that time, he has consulted with a variety of plan types and sponsors in both the public and private sectors. Matt currently serves as the lead actuary for both the Oregon Public Employees Retirement System and the Florida Retirement System. He assists clients with a variety of matters, including actuarial valuations, financial reporting, contribution strategy, stakeholder communications, plan design, experience studies, legislative impact assessments, and economic scenario analysis. He has a BS in Mathematics and a BSEE in Electrical Engineering from the University of Utah, and is a member of the American Academy of Actuaries Public Plans Subcommittee.

ACKNOWLEDGEMENTS

The authors would like to thank the following people for providing assistance and patiently answering questions during the research: Daniel Andersen; Shonda Bourquin; Betsy Butler; Mark Feldhausen; Allen Foster; Garry Green; Harry Halley, III; Michael Hairston; Mark Olleman; Karl Paulson; Jake Ramirez; Gary Russell; Bryan Reinhardt; Jennifer Starr; Travis Turner; and Robyn Wheeler. The views in this report and any errors or omissions are those of the authors alone.

EXECUTIVE SUMMARY

In 2016, 14.6 million active state and local government employees had defined benefit (DB) pension coverage through their employers.[1] DB pensions play an important role in the human resource strategies of government employers. DB pensions have been shown to be an effective retention tool, and government employers are well suited to offer them. At the same time, DB pensions are highly valued by employees in the public sector. Pensions' staying power in the public sector stems from the fact that these systems serve employees, employers, and taxpayers well.[2]

For more than a decade, a handful of states have offered public employees a choice between a traditional DB pension and a defined contribution (DC) account as their primary retirement plan.

This report, an update of a previous NIRS report published in 2011,[3] examines those states that offer employees a choice between primary DB and DC plans, and finds that:

- When given the choice between a primary DB or DC plan, public employees overwhelmingly choose the DB pension plan.
- DC plans are less cost efficient than DB plans, due to lower investment returns, and the lack of longevity risk pooling.
- Some states have considered moving employees from a DB-only to a DC-only structure in an attempt to address an unfunded liability. Making this shift, however, does nothing to close any existing funding shortfalls, and can actually increase retirement costs.
- Traditionally, employers bear most of the risk in DB plans, and employees bear most of the risk in DC plans. The public sector has always had cost sharing in its DB pensions and employees have experienced increases in their portion of plan contribution in recent years.

The experience in the public sector thus far indicates that public employees highly value their DB pension benefits. This, coupled with the fact that DB pensions remain the most cost-effective way to fund a retirement benefit, suggests that the public sector is unlikely to mimic the trend away from DB pensions in the private sector.

INTRODUCTION

DB Plans and DC Plans Are Very Different

Defined benefit (DB) pension plans are designed to provide employees with a predictable monthly benefit for life when they retire. The amount of a monthly pension is typically a function of the number of years an employee devotes to their job and the worker's pay, usually at the end of his or her career. This plan design is attractive to employees because of the financial security it provides. Employees know they will have a steady, predictable income that will enable them to maintain a stable portion of their pre-retirement income.

DB plans are pre-funded retirement systems. That is, employers—and, in the public sector, employees—make contributions to a common pension trust fund over the course of each employee's career. These funds are invested by professional asset managers whose activities are overseen by trustees and other fiduciaries. The earnings that build up in the fund, along with the dollars contributed while working, pay for the lifetime benefits an employee receives when he or she retires.

Defined contribution (DC) plans, such as 401(k) plans, function very differently than DB plans. First, there is no implicit or explicit guarantee of a certain level of retirement income in a DC plan. Rather, employees and sometimes employers contribute to the plan over the course of a worker's career. Whether the funds in the DC account will ultimately be sufficient to meet retirement income needs will depend on a number of factors, such as the level of employer and employee contributions to the plan, the investment returns earned on assets, whether loans are taken or funds are withdrawn prior to retirement, and the number of years a retiree will live after they leave work.

DC plans consist of separate, individual accounts for each participant. Plan assets are typically "participant directed," meaning that each individual employee can decide how much to save, how to invest the funds in the account, how to modify these investments over time, and how to withdraw the funds at retirement.

Along with differences in contributions and investments during employees' careers, another important difference between DC and DB plans becomes apparent at retirement. Unlike in DB plans, where retirees are entitled to receive regular, monthly pension payments for life, in DC plans it is typically left to the retiree to decide how to spend down one's retirement savings. Research suggests that many individuals struggle with this task.[4] Since retirees find it difficult to estimate how long they will live, they either draw down funds too quickly and run out of money, or hold onto funds too tightly and self-impose a lower standard of living as a result.[5] In theory, employers that offer DC plans could provide annuity payout options, but in practice they rarely do.[6] See **Table 1** for a comparison of such features.

Public Plan DB/DC Choices

Unlike employees in the private sector, who have seen a drastic decrease in DB plan coverage, most public employees still participate in a DB plan. For example, a comparison of a 2008 report from the Bureau of Labor Statistics (BLS) with the 2016 National Compensation Study (NCS) shows that private sector participation in DB plans dropped substantially from 76 percent of full time employees in 1986 to 15 percent in 2016, yet public employee participation in DB plans only dropped from 93 percent of full time employees in 1986 to 75 percent in 2016.[7]

Thus, while private sector DB coverage has declined sharply in the last three decades, public sector coverage has declined modestly; as most state and local government employees still

Table 1. **Selected Differences Between DB Plans and DC Plans**

	Defined Benefit Plan (Traditional Pension)	Defined Contribution Plan (such as 401(k), 403(b), 457)
Contributions	In the public and private sectors, contributions are made on behalf of each employee by the employer. In the public sector, the majority of pensions are "contributory," meaning that employees also contribute to the plan out of their own paychecks.	Employees make their own contributions to their savings account at whatever rate they choose. In the private sector, employers will often make a certain match—for example, 50 cents on the dollar up to 6 percent of pay—but they, like employees, are not required to contribute at all. In the public sector, employers often specify that employees must make a certain level of contributions to the plan with an option for additional voluntary savings. Contribution rates for public employers are often specified in legislation. Public employees who have a choice between DB and DC often contribute similar amounts to the DC accounts as to DB plans.
Investments	Contributions for all employees are pooled, and invested by professional asset managers in a diversified portfolio of assets—stocks, bonds, real estate, etc.	Investment portfolios consist of individual accounts for each employee. Employees typically make all investment decisions themselves, and can choose from a range of investment options offered. Plans increasingly offer funds that target asset allocations based on a year when retirement might occur, often called "target date funds" or TDFs.
Amount of Money in Retirement	The monthly benefit is determined by a set calculation, usually based on years of service and pay at the end of one's career.	The money available in retirement is simply the amount that one has accumulated in the savings plan, through contributions and investment earnings.
Lifetime Income	Payouts are provided as a monthly income stream that is guaranteed for the remainder of the retiree's life, and that of the surviving spouse, if the member elects.	Plans are generally not required to offer a lifetime income option, and typically pay out benefits as a one-time lump sum or as periodic lump sums.
Supplemental Benefits	Spousal protections, disability benefits, and cost of living adjustments are common.	Supplemental benefits are not applicable, and generally not available. If provided, they require extra contributions to some structure outside the DC plan.

provide DB pension coverage to their employees.[8] A handful of states offer public employees a choice between a traditional DB pension and a DC account as the primary retirement plan.

This paper analyzes the following questions:

- When given the choice, what do public employees choose: the retirement system with a DB pension or a DC-only plan?
- What happens when employees choose their own investments?
- Can employers choose to offer meaningful supplemental benefits to DC members?
- What are the implications of an employer choosing to change from a DB to a DC plan?
- What are the implications for risk sharing in each of the systems, and is there a way to shift additional risk to employees under the DB plan?
- Finally, do employers give employees the chance to choose a second time?

This paper updates the experience of statewide retirement systems that offer a choice between DB and DC plans since the 2011 report, and continues to provide some answers to the above questions.

To conduct the study, we requested information directly from the retirement systems that allow new hires to choose among DB, DC, and combination plans. These systems provided the actual statistics of what percent of members have selected each option. We also asked for other important provisions relating to benefits and contributions. This primary source material provides a valuable insight into what really happens when public employees are allowed to choose between DB and DC plans.

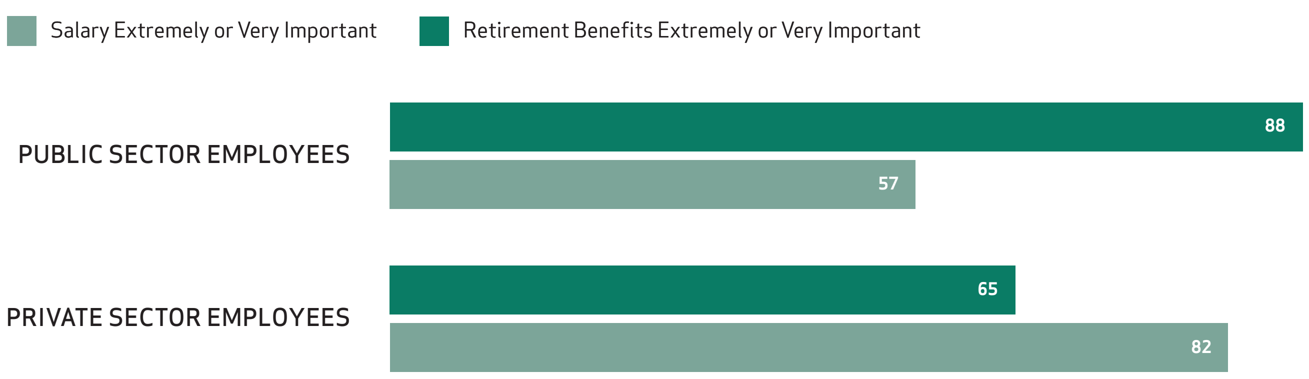
OVERWHELMINGLY, PUBLIC EMPLOYEES CHOOSE THE DB PLAN

Although there is a common perception that DC plans may be more attractive to new employees than DB plans, relevant research seems to show the opposite—especially among state and local employees. NIRS public opinion polling in 2017 found that 85 percent of Americans believed that workers should have access to a pension plan.[9] Furthermore, the same study demonstrates that an overwhelming majority of the American public believes that public employees, such as police officers, firefighters, and public school teachers, deserve a DB pension.[10] As displayed in **Figure 1**, NIRS has also found a significant difference in the level of importance public employees, who are typically covered by defined benefit plans, place on their retirement benefits when compared to the value that employees in the private sector attach to retirement benefits.[11]

So, what do public employees really prefer? Seven statewide systems have been giving new hires the choice between participating in a DB plan or a DC plan for various periods over the last 18 years. These systems are the Colorado Public Employees Retirement Association (PERA); the Florida Retirement System (FRS); the Montana Public Employees Retirement Association; the North Dakota Public Employees Retirement System (NDPERS); the Ohio Public Employees Retirement System (OPERS); the State Teachers Retirement System of Ohio (STRS); and the South Carolina Retirement System (SCRS). In Utah and Michigan, some or all employees have a choice between a combined DB/DC plan and a DC-only plan. **Table 2** and **Figure 3** summarize the experience of these systems, all of which allow their members to choose between a DB plan and a DC plan. Additionally, in Ohio, members also have the choice of a "combined" plan, where

Figure 1: **Retirement Benefits are Significantly More Important to Public Workers as Compared to Private Sector Workers**

When making job decisions, how important are the following job features to you?



Source: NIRS Report "Retirement Security 2017: Americans' Views of the Retirement Crisis."

Table 2. **New Hire Elections in 2015 For Systems with Choice of DB or DB/DC and DC Plan**

System	DB Plan Enrollments	DC Plan Enrollments	Combined Plan Enrollments
Colorado PERA	88%	12%	Not offered
Florida Retirement System	76%	24%	Not offered
Michigan PSERS	75%	25%	DB is a combination plan
North Dakota Public Employees Retirement System	98%	2%	Not offered
Ohio PERS	95%	4%	1%
Ohio STRS	89%	9%	2%
South Carolina Retirement Systems	82%	18%	Not offered
Utah Retirement System	80%	20%	DB is a combination plan

"Not offered" means enrollment in a combined DB/DC plan is not offered.

employer contributions fund a DB plan and employee contributions fund a DC plan. Due to data availability issues, plan choice data from the Montana Public Employees System was not available after 2012 for this study.

Across the board, the experience of these systems indicates that public employees overwhelmingly choose the DB plan. In 2015, North Dakota's DB plan has the highest take-up rate at 98 percent; the lowest DB take-up rate is in Michigan, which still saw 75 percent of employees opting for the DB pension. This means the percentage of new employees electing DC plans currently ranges from 2 percent in North Dakota to 25 percent in Michigan. The legislation in North Dakota that allowed employees to choose between NDPERS and a DC account had a sunset provision after ten years and since legislation to continue offering a DC option was not enacted this choice will not be extended beyond July 2017.

The trend of overwhelming DB coverage in states with a choice has been consistent over time. As shown in **Figure 3**, the DB take-up rates in all of these states have been above 70 percent in all years, and five of the systems have take-up rates of 80 percent or more during the years studied.

It should be noted, however, that many employees who do not actively elect one plan or another are defaulted into the DB plan. Unlike the private sector which uses defaults into 401(k) savings plans to build plan participation rates, most workers in the public sector are covered by a retirement plan as a condition of employment. Defaulting employees into the traditional DB plan is similar to a private-sector employer investing employee contributions into an appropriate investment allocation with the intent of reducing risk to the participant as the default investment choice.

Another possible reason that public employees select the DB default is that their preferences for DB pensions are "revealed" preferences—that is, they reflect a preference realized by deliberately seeking out an employer that offers this type of plan. For instance, a Florida survey found that "up to 41 percent of the defaulters may be using this option as their active election in the belief that by defaulting there could be no mistakes made in their plan choice."[12] Also, public safety employees appear to have a strong attachment to defined benefit plans and municipalities that have switched this category of employees to a DB/DC or DC only plan have experienced high turnover among new and existing public safety officers.[13]

The overwhelmingly high take-up rates, then, could be at least partially driven by inertia on the part of new employees, a large number of whom do not make an affirmative choice. In most states with a choice between DB and DC plans, members must actively choose the DC plan. However, the experience in Washington State where the state reopened the closed DB plan (Plan 2) as an option to the combined DB/DC plan (Plan 3) is illuminating as to employee preferences.

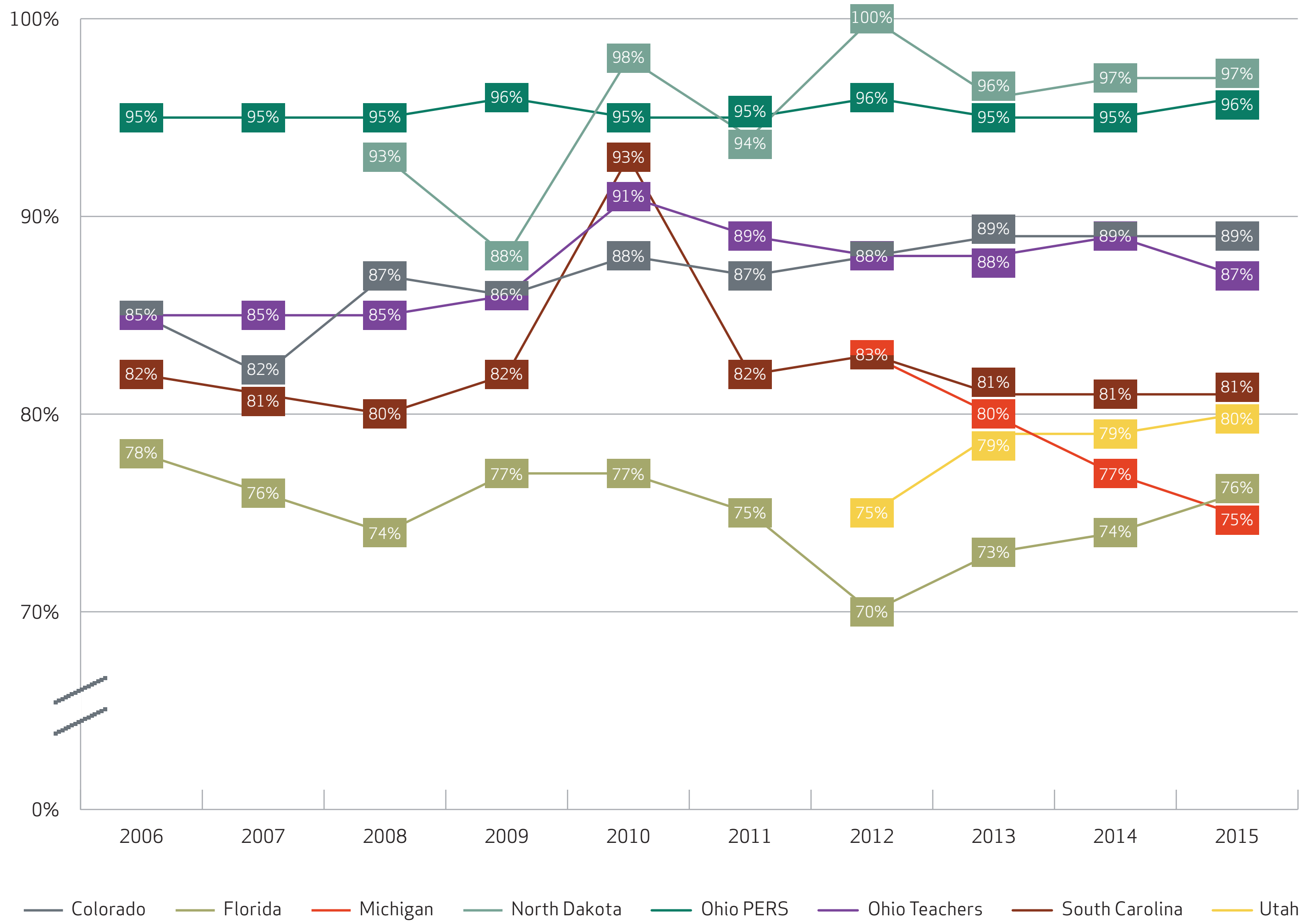
Figure 2. **Washington State Plan Employee Elections for DB Plans (PERS 2 and TRS 2) and Combination Plans (PERS 3 and TRS 3)**

	PERS 2 active enrollments	PERS 3 active enrollments	PERS 3 default enrollments	TRS 2 active enrollments	TRS 3 active enrollments	TRS 3 default enrollments
2002	64%	18%	18%			
2003	63%	15%	22%			
2004	63%	17%	19%			
2005	64%	17%	19%			
2006	66%	17%	16%			
2007	65%	17%	18%	39%	46%	16%
2008	62%	17%	20%	42%	37%	21%
2009	64%	15%	21%	45%	33%	21%
2010	63%	14%	23%	48%	30%	23%
2011	62%	14%	23%	48%	30%	22%
2012	62%	15%	23%	49%	31%	20%
2013	63%	14%	23%	55%	35%	19%

As displayed in **Figure 2**, recent plan selections of new employees into the Washington state plans that offered the option of entering the Plan 2, the DB option, indicates the strength of the preference that employees have for a DB plan. In 2013, the largest plan—PERS—had 63 percent of employees choose PERS 2, while the plan covering teachers had 55 percent of new teachers choose TRS 2. As legislation passed in Florida in 2017 and Michigan in 2017 will change the default plan in these states to a DC plan going forward, we may get further information about such decisions in future years.

Figure 3 shows that most of these DB/DC choice plans have had relatively stable election percentages in the time they have existed. That is, the vast majority of public employees have consistently chosen the DB option. However, this is not to say that members will continue to make the same choices in the future. The historic stock market declines in 2008 to 2009 have certainly influenced some public employees. While three statewide plans showed a sharply increased election of the DB plan option in 2010, subsequent elections of members in those states fell back to a lower and more stable rate of selecting the DB plan.

Figure 3. **Total DB Elections over the Ten Years Between 2006 and 2015**



Please note that the DB plan is a default option. See the Technical Appendix for detailed information on each state's take-up rates over time.

WHEN EMPLOYEES CHOOSE THEIR OWN DC INVESTMENTS, RETURNS ARE LOWER

Research indicates that the average employee directing their own investments in a DC plan tends to earn lower investment returns than statewide DB systems, for a variety of reasons. DB plans tend to achieve higher investment returns than DC plans because assets are pooled and professionally managed. The investment advantage in DB retirement systems comes from three factors: lower expenses, not having investment returns reduced because of individual investor decisions, and unlike DC accounts, the DB fund can maintain an optimal investment allocation over time.

Expenses paid out of plan assets to cover the costs of administration and asset management reduce the amount of money available to provide benefits. As a result, a plan that can reduce these costs will have higher amounts of dollars accumulated. By pooling assets, large DB plans are able to drive down asset management and other fees. For example, researchers at Boston College found that asset management fees average just 43 basis points for public sector DB plans, while average DC plan expenses were 97 basis points.[14] Additionally, U.S. Census data indicates a similar cost of 45 basis points for state-administered DB plans.[15] Asset management fees for private sector 401(k) plans vary widely and range from 0.60% to 1.70% of assets.[16] Callan researchers found that asset-weighted expenses for large institutional mutual funds used in DC plans was 85 basis points, not including administrative expenses of plans.[17] Morningstar also found that fees for target date funds also spanned a wide range, with weighted fees estimated at 91 basis points in 2012.[18] Based on this data, DC accounts experience a 40 to 45 basis point fee disadvantage, as compared with public DB plans.[19]

But fees are only part of the story. DB plans achieve greater investment returns compared to the returns achieved by individual DC plan participants who control the investment of their accounts, because the DB plan benefits from professional management of assets. It is well documented that individual investors make inappropriate investment decisions with respect to both asset allocation and market timing decisions. These actions result in DC accounts earning returns that lag behind market and fund returns.[20] Investing too little or too much in stocks or reacting emotionally to market swings by selling assets in down markets is referred to as "behavioral drag." Studies of individual investor behavior data show that individuals earn returns that are significantly lower than returns posted by the funds in which they invest.[21] For example, one study by Morningstar found that investors lagged behind mutual fund returns by 95 basis points in the ten years that ended on 2012 and 249 basis points in the ten years that ended in 2013. The study also examined the net flows in and out of each asset class and found that funds tended to flow out before prices rose and to flow in before prices fell.[22] While these differences may appear small, over a long period of time they have a significant impact. To illustrate, over 40 years, a one percent increase in fees and/or returns compounds to a 24 percent reduction in the value of assets available to pay for retirement benefits.[23]

While a number of DC plans today attempt to address the lower returns that individual plan participants earn by using TDFs to either offer or default employees into more appropriate asset allocations for their retirement savings, public DB retirement systems have another advantage in that they can maintain an optimal investment allocation consistently. As explained in "Still a Better Bang for the Buck," DB plans have a much longer investment horizon than individuals, and can take advantage of the enhanced investment returns that come from maintaining a balanced portfolio over a long period of time.[24] The reason behind this longer investment horizon is that a mature DB plan has a mix of younger workers, older workers and retirees—as younger workers continue to enter the plan. By contrast, individuals in DC plans must gradually shift to a more conservative asset allocation as they age, in order to protect against financial market shifts later in life. This means that DB plans can ride out bear markets and keep a larger share of their investments in stocks and other assets that offer higher expected average returns over the long term, but fluctuate more in the short term, compared to bonds and other fixed income securities. DB plans are also better positioned to take advantage of more illiquid investments that offer higher expected "risk premium" returns—for instance, real estate and private equity. These factors have allowed DB pensions to historically earn higher gross returns based on asset allocation.[25] The consensus of investment professionals is that allocation-driven differences in average annual DB versus DC investment performance will continue into the future.

There also is historical experience in two states, Nebraska and West Virginia, which illustrates DB plans' investment performance advantages.

Nebraska offered state and county employees hired between 1964 and 2003 only a DC plan, while its school employees, judges, and state patrol were covered by a DB plan. Over the 20 years leading up to 2002, the average return in the DB plans was 11 percent and the average return in the DC plans was between 6 percent and 7 percent. One reason for this large difference was the conservative allocation of nearly 50 percent of DC member contributions to a stable value fund, which was the default for members not making a specific investment election. Partially due to the lower returns, employees were receiving a replacement ratio of their pre-retirement income closer to 30 percent of salary rather than the projected 50 percent to 60 percent of salary. Since 2013, Nebraska state and county employees have been covered in a cash balance plan with professional management of the assets.

West Virginia had a similar experience when teachers hired between 1991 and 2005 were only offered a DC plan. After July 1, 2005, all newly-hired teachers went back into the teacher retirement system's original DB plan. One of the reasons for this change is that average DC returns lagged behind DB returns. Between 2001 and 2010, the average annual DB return was 160 basis points higher than the average DC return. For more details, see the Technical Appendix.

In addition to the investment advantage, more retirement income comes from DB plans because they also pool the longevity risks of a large number of individuals. Unlike DC accounts which can run out of money in individual retirees' later years, DB plans need only to accumulate enough funds to provide benefits for the *average* life expectancy of the group. If individual retirees took a distributional approach in a DC plan, they would face a 50 percent chance of running out of money during retirement. In order to reduce the risk of running out of funds, individuals in a DC plan need to accumulate funds to last several years *past* average life expectancy. Even using only the 80th percentile life expectancy, which exposes participants to a one-in-five chance of running out of income in retirement, the DC plan requires significantly more funding and/or leads to a lower standard of living in retirement for DC plan participants.[26]

SOME DC MEMBERS CAN POOL INVESTMENT EXPERTISE WITH THE DB PLAN, AND ACHIEVE HIGHER RETURNS

In response to the lower returns generally earned in DC plans, some states offer employees with DC accounts the option of investing in the same manner as the DB pension system—and thereby earning exactly the same returns as the DB plan. For example, the members of Washington State Plan 3 have the option to invest in the Total Allocation Portfolio (TAP), which mirrors the investments in the state DB plan and therefore earns the same returns. Initially, Washington made the TAP the default investment option for Plan 3 members. But the state switched the Plan 3 investment default after July 22, 2011, to its Retirement Strategy Fund, which is a target date fund.

All employee contributions of members in the Oregon Public Service Retirement Plan are invested in the state's Individual Account Program (IAP). Like Washington's TAP, Oregon's IAP money is invested in the same manner as the DB plan. However, unlike Washington's TAP, which is one of many investment choices, Oregon's IAP currently offers no other investment choices, although implementation of mandated TDFs is under consideration at the time of this study's publication.

Both Washington Plan 3 and Oregon IAP provide members with a professionally managed portfolio. Washington's approach leaves room for individual risk tolerance, as its members may prefer to invest more conservatively as they approach retirement. It is also worth noting that both Washington and Oregon offer combination plans, in which employer contributions fund a DB plan and employee contributions fund a DC account. This is significant because the DB plan provides a level of guaranteed lifetime income regardless of DC investment returns.

DEATH AND DISABILITY BENEFITS CAN BE PROVIDED TO DC PARTICIPANTS, IF EXTRA CONTRIBUTIONS ARE MADE

Meaningful death and disability benefits can be provided in a DC environment, but require extra contributions that are not deposited to the members' DC accounts. Consider the choices two states have made to respond to the criticism that DC accounts do not provide adequate spousal and disability benefits.

In Florida, where members choose between a DB and a DC plan, disabled members can choose to surrender their DC account balance at the time of disability and receive the same disability benefits as provided by the DB plan. If DC members die in the line of duty, their surviving spouse receives a life annuity paralleling those provided in the DB plan. These benefits are financed by a separate charge that varies by employee type. If DC members die other than in the line of duty prior to retirement, their death benefit is the DC account's balance.

Alaska has a different approach. Alaska public employees hired after July 1, 2006, are only offered a DC plan. Here the occupational death and disability benefit is 40 percent of salary until normal retirement and 50 percent of salary for the occupational death of police and fire members. The employer contibutes both the employer and employee contributions into a special occupational death and disability trust account until the member reaches normal retirement, or until the date the member would have reached normal retirement in the case of occupational deaths. At normal retirement age, the 40 percent or 50 percent of salary benefit stops, and the member, or survivor, receives the DC account as well as the accumulated contributions from the occupational death and disability trust account with actual returns net of expenses. Employers make contributions into a separate fund to finance the extra benefit not provided by the DC account.

MOVING FROM DB TO DC CAN INCREASE COSTS

Several states around the country have looked prospectively at eliminating their DB plans, moving all new hires into DC accounts. DB funding problems are often one of the reasons behind these efforts. Yet, freezing a DB plan and moving all employees to a DC plan that provides a similar level of retirement income can potentially increase costs for the employer and taxpayers at exactly the wrong time. This can occur for three distinct reasons.

First and most important, DC plans do not have the economic efficiencies of DB plans. This drives up the retirement costs to provide an identified level of lifetime retirement benefits. DB plans save money by pooling risks and achieving greater investment returns. According to one estimate, a DB plan can provide the same lifetime retirement replacement income at about half the cost of a DC plan.[27] Thus, when a DB plan is frozen and replaced with a DC plan, far greater contributions from employers, taxpayers and employees would be required to maintain the same level of benefit in a DB plan.

Second, maintaining two plans is more costly than operating just one. State and local governments typically do not have the option of transferring current employees out of a DB plan and into a new DC plan.[28] This means the employer will have to bear the administrative costs for two plans, at least until the DB plan is finally phased out completely—a process that would take many decades as employees in the system complete their careers, retire, and ultimately die. Additionally, there is some selection risk in offering employees a choice of a DB or DC plan, because employees who are not committed to staying with their new employer will likely choose the DC plan and achieve greater benefits (with associated higher cost).

Finally, when a DB plan is closed, payments to amortize the unfunded liability for the DB plan may be accelerated. Doing so would increase near-term plan contributions while lowering later plan contributions. Taking this approach would be consistent with the DB plan's shorter future once it is closed, as one typical goal of an actuarially sound funding policy is to attempt to fully pre-fund benefits during the working lifetimes of employees benefiting from the plan.

These factors have influenced many states studying whether to switch from DB to DC. As a result, the vast majority have chosen to keep their DB plan in the best interests of employers, taxpayers, and employees.

MOVING TO DC DOES NOT SOLVE FUNDING PROBLEMS, AS SEEN IN WEST VIRGINIA

Regardless of potential cost increases, changing from DB to DC does not solve the underlying funding problems a state may be experiencing.

One interesting case study is the West Virginia Teachers Retirement System (TRS). In 1991, West Virginia closed TRS to new members, and all new hires were put into a DC plan. The state later found, however, that this "funding solution" had overlooked some important considerations. Specifically:

- New members do not start with any unfunded obligation.
- Projected DC contributions for new members were worth more than the projected DB costs for those members.
- No unfunded obligations for existing members are reduced when new members go into a DC plan.

As a result, the loss of new members made it more difficult to finance the unfunded obligations of the DB plan.

By 2003, the state began reexamining this switch. The 4,500 members who were transferred from the DB to the DC plan in 1991 found it hard to retire after the bear market of 2000 to 2002. As previously mentioned, DC member accounts achieved much lower investment returns than the DB plan. After studying the issue extensively, the state decided that starting in 2005, all new hires would go into the DB plan. The state also found that providing equivalent benefits would be less expensive under the DB than in the DC plan. The state showed discipline to achieve a better funded position, with extra contributions of $290.1 million in fiscal year 2006 and $313.8 million in fiscal year 2007. In addition, West Virginia completed a tobacco bond securitization in fiscal year 2007 and deposited $807.5 million of the proceeds into TRS as another special appropriation. In June of 2008, the teachers in the DC plan were given the choice to switch to the DB plan, and a full 78 percent chose to switch, including 76 percent of younger teachers (under 40 years old).[29]

West Virginia projected a $1.2 billion savings over the first 30 years by moving new entrants from the DC to the DB plan. This relies on an assumed return of 7.5%. When the Legislature asked about the impact of lower returns, calculations showed an investment return of 6 percent or more was needed for the DB plan to save money.[30] The action taken in West Virginia to move TRS members back to a DB plan was also accompanied by a commitment to increase funding for the system. As a result, the funding level of TRS had improved from 25 percent in 2005 to 62 percent by then end of 2016.[31]

One way to finance preexisting unfunded liabilities and to defray employer expenses is to require specific contributions to the DB plan as a percent of total payroll, including DC members. Colorado, Florida, Michigan TRS, Ohio PERS, Ohio Teachers, Utah, and South Carolina all require contributions paid as a percentage of total payroll. The cost to finance existing liabilities are credited to DB plans and are not credited to DC member accounts. See the Technical Appendix for details.

HOW MUCH CAN SYSTEM POLICIES AND POLICY-MAKERS AFFECT PLAN CHOICE DECISIONS?

This study yet again confirms the preference of a clear majority of public sector employees for a DB plan when they are offered a choice between a DB and a DC plan. While the preference for a DB plan over a DC plan is consistent across systems, each system is unique and has its own policy-making environment that determines benefit and funding policies.

In certain systems, the policy-making entity—typically the state legislature—will have a clear affinity for the cost-certainty of a DC plan. And in these systems, if the policy-making entity *wants* to encourage employee selection of a DC plan, to what extent can policy decisions modify employee choice behavior? Two particular systems provide insight into how legislatures have encouraged employee selection of a DC plan: the Utah Retirement Systems and the Florida Retirement System.

Utah - Transferring DB Funding Risk from Employers to Employees

Traditionally, employers take most of the risks in DB plans and employees take most of the risks in DC plans. For example, in traditional DB plans, employers take on all of the funding risk. This includes the normal cost for current benefits earned in the year and if an unfunded liability in the DB plan develops, the employer is solely responsible for filling that funding gap. Of course, public employees may indirectly take on some of that risk, for example, through increased employee contributions or decreased benefits. But, the legal and fiduciary responsibility to pay down the unfunded liabilities remains with the employer. Under DB plans, employers are largely responsible for investment risk, inflation risk, and longevity risk. Under DC plans, on the other hand, the funding risk, investment risk, inflation risk, and longevity risk are solely assumed by employees. See **Table 3**.

Beginning on July 1, 2011, Utah Retirement Systems (URS) eligible employees were offered a choice between a DC-only plan and a combination plan, which has both DB and DC components. While each component of the combination plan has a standard-looking benefit design, the system has a *very* unique and innovative funding structure that includes some potentially significant financial disincentives to discourage employees from choosing the combination plan, thus encouraging them to select the DC-only plan.

The structure of the DC-only plan is very straightforward. General employees who select this plan receive a 10 percent of pay employer contribution, with no mandatory employee contributions, while public safety employees receive a 12 percent contribution. The rest of this section focuses on the plan for general employees, but identical mechanics apply to the plan for public safety employees.

The combination plan is not as straightforward. General employees who select the combination plan also receive an identical 10 percent employer contribution. But, if the 10 percent employer contribution is insufficient to fund the DB component, due to poor investment returns or changes in actuarial assumptions, employees would be required to make up the difference through mandatory contributions. However, any portion of the employer contribution that is not needed to fund the DB plan will be deposited into employees' DC accounts.

Employees in Utah, then, must make a unique decision: in order to get the advantages of a DB plan, including a guaranteed benefit for life, professional investment management, and the benefits provided by longevity pooling, they must also take on some of the funding and investment risks. Employees are not *forced* to take on the DB risk, however; it is a choice, and they can opt for the DC plan instead—which, of course, comes with its own set of risks. If a general employee chooses the DC plan, the employer will contribute 10 percent of pay to the DC account. If the employee chooses combination plan, the employer will contribute 10 percent of pay as described above. Thus, under either plan, the employer contribution is a flat

Table 3. **Risks in Traditional DB and DC Plans, and Utah's Combination Plan**

	Typical DB Plan (Traditional Pension)	Typical DC Plan (401(k), 403(b), 457)	Utah's Combination Plan
Funding Risk	Employer assumes most of the funding risk. Although the employer is responsible for fully funding the plan, employees can share this risk through increased employee contributions or reduced benefits, should an unfunded liability develop.	Employees assume all funding risk.	Employees assume all funding risk above the 10 percent employer contribution.
Investment Risk	Employer assumes most of the investment risk. The employer is responsible for making all investment decisions, however, should unfunded liabilities develop as a result of low investment returns, employees can share this risk through increased employee contributions or reduced benefits.	Employees assume all investment risk.	Employers assume all investment decisions, but employees assume a portion of investment risk in terms of any unfunded liabilities that may develop if the investments fall short and more than a 10 percent contribution is required.
Inflation Risk	If the plan offers a cost of living adjustment (COLA), depending on the COLAs structure, employers may assume all inflation risk.	Employees assume all inflation risk.	The plan offers an automatic CPI COLA, but it is capped at 2.5%.
Longevity Risk	Employers assume all longevity risk to provide lifetime retirement income.	Employees assume all longevity risk to provide lifetime retirement income.	In addition to assuming all longevity risks for the DC component, employees assume some longevity risk in terms of any unfunded liabilities that may develop as a result of members living longer than assumed.
Portability/ Leakage Risk	Employees bear portability risk, in that they are likely to receive lower benefits should they terminate before retirement. Career employees bear no leakage risk, as withdrawals cannot be taken prior to retirement. Employees who terminate before retirement may withdraw their contributions and forfeit their benefit.	Employees bear no portability risk, as assets accumulated in the account can be taken without penalty when terminating employment. Employees bear leakage risk, in that accounts are not always rolled over when changing jobs, and loans and pre-retirement withdrawals are often allowed, which can reduce account balances available at retirement.	As this plan combines a base DB benefit with a DC account, portability and leakage risks are proportionate as described in the first two columns.

10 percent of pay. The employer is financially neutral to the employee's decision. See **Table 4**.

URS's unique funding structure encourages new hires to select the DC-only plan choice by subjecting employees who select the combination plan to possible future employee contributions, with those contributions varying annually to reduce DC contributions or possible future employee contributions.

Interestingly, the changes in Utah were intended to avoid future funding problems rather than solving any immediate funding issues. Although Utah had a funded ratio close to 100 percent before the market crisis, the stock market decline of 2008 to 2009 did impact its funding status. Therefore, the Utah Legislature commissioned a study to project the system's funding and to gauge the impact of putting new hires in a less expensive plan with less cost volatility.

What differentiates the change in Utah is not cost savings, however; it is risk shifting. If another market downturn occurs, the employers' contributions for general employee hires will remain 10 percent of pay; the employees in the combined plan will absorb the risk through a combination of smaller deposits to their DC accounts, as well as possible mandatory payroll deductions. Those employees who selected the DC plan will not see an automatic adjustment to restore the funding of their retirement benefit, but they may find that unless they choose to make additional contributions the amount of their income in retirement will be lower or they will have to work a few more years to make up for the investment losses in their account.

Table 4. **Utah Retirement Systems**

	All Employees Hired Before July 1, 2011	**General Employees Hired after July 1, 2011: Combination and DC Options**	
	Tier 1 DB	Tier 2 Combination Plan	Tier 2 DC Plan
Employer Contribution	Employer pays total cost with no cap	Always 10 percent of pay	Always 10 percent of pay
Employee Contribution	0 percent of pay into DB plan	Automatic payroll deduction required if DB contributions are greater than 10 percent of pay	Employees may contribute, but contributions are not mandatory
DB Normal Cost Rate	12.25% of pay in 2017	8.22% of pay in 2017	N/A
DC Account Contribution	1.5% of pay	10 percent of pay less required DB contribution	10 percent of pay
Final Average Salary Period	3 years	5 years	N/A
Percent of Final Average Salary Replaced per Year of Service	2.0% multiplier	1.5% multiplier	N/A
Unreduced Benefit	Age 65, or 30 years of service, age 62 at 10 years of service with actuarial reductions, or age 60 at 20 years of service with actuarial reductions	Age 65 or 35 years of service	N/A
Cost of Living Adjustment	CPI up to 4 percent	CPI up to 2.5%	N/A
Vesting Period	4 years of service	4 years of service	4 years of service

The normal cost rate for the DB component of the combination plan is 8.22% of pay for the 2017 fiscal year. Thus, general employees covered by the combination plan have 1.78% of pay deposited to their DC accounts in that year. **Table 4** summarizes the differences between the old and new plan designs.

The employer funding cost of the two choices available to new URS-eligible general employees is equivalent and fixed at 10 percent of pay. By subjecting employees in the combination system to the financial risk of potential mandatory DB contributions and a reduction in take-home pay, the Utah Legislature signaled a policy preference for more employees to choose the DC-only plan. How effective has the policy been in influencing employee plan choice behavior? While Utah has the second-highest overall rate of employees choosing a DC option in the study, that rate is only 20 percent to 25 percent of employees as shown in **Figure 3**. The combination plan, which includes a DB component, remains the choice of a substantial majority of new employees.

Florida – Past and Future Policy-Maker Encouragement of DC Choice

Since 2002, employees in the Florida Retirement System (FRS) have been able to choose between a DB and DC plan. In the initial years after plan choice was established, the percentage of employees who decided to join the DC plan remained steady around 25 percent.

Following the 2008 economic downturn, the actuarially calculated contribution cost for the DB plan significantly increased. Partially in response to those downturn-related cost increases, the Florida Legislature made significant changes to benefit and funding policies effective in 2011. Specifically, while an employee contribution of 3 percent of pay was introduced for *both* the DB and the DC plans, only the DB plan *decreased its* total benefits. Thus, new employees who joined FRS in 2011, were faced with a choice between a DB plan with lower benefits, against a DC plan with unmodified total benefits.

Following these changes, only an additional 5 percent of new employees enrolled in the DC plan in 2012, increasing the selection of the DC plan from 25 percent to only 30 percent.

Subsequently in 2012, due to continuing budgetary pressures, the Florida Legislature lowered the total benefit level in the DC plan. Following the decrease, the rate of new employees choosing the DC plan dropped from 30 percent in 2012 to only 24 percent of new employees selecting the DC plan in 2015.

Most recently, to once again encourage higher rates of DC plan choice, the Florida Legislature has changed the default enrollment option to the DC plan for new members entering FRS starting in 2018. While it is possible that this policy modification will have a significant effect on employee plan choice decisions, it seems more likely that the impact will be comparatively modest.

What About Do-Overs?

One plan design issue employers face is whether to give employees a chance to change their mind, and switch to the alternative retirement plan. Having a do-over option may be particularly valuable to employees whose situations change unexpectedly. For example, a teacher who is married to a member of the military and expects to move frequently may initially choose the DC plan, as the portability aspect may be most attractive. However, if the couple's plans change and they decide to settle more permanently, the teacher may then wish to switch over into the DB plan.

Washington requires new hires to make a one-time irrevocable decision, but several other systems do allow for a change. Colorado PERA allows members to change their election one time in years two through five after they are hired. Ohio Teachers allows members in the DC or combined plan a one-time chance to change in the June following their fourth anniversary of service, and South Carolina allows members to change their election after the first year but before the end of their fifth year, but the change can only be from the DC plan to the DB plan. Florida allows members to change once at any time before retirement or termination of employment. Ohio PERS allows members to change once.

Different systems handle employees' switches in different ways. Florida allows two choices when members switch from DB to DC. The members can either (1) freeze their current DB benefits based on service and salary to date and have future contributions accumulate in their DC accounts, or (2) convert their DB benefits into DC accounts based on the present value of their accrued normal retirement benefit. If a Florida member wants to switch from DC to DB, the member must pay the full cost based on the actuarial liability which would have accumulated if the member was in the DB program since they were hired. The DC account is used first. If there is more money than needed in the DC account, the member keeps the excess assets in the DC account. If there is not enough money in the DC account, then the member must pay the difference or stay in the DC plan.

In Florida, only 84,155 employees have chosen to utilize the second-election since the inception of the FRS Investment Plan in 2002. With nearly 700,000 active members when the option was implemented, 514,629 active members as of July 1, 2016, and between 45,000 and 98,000 new hires each year for the past thirteen years who could take advantage of the option, this represents a small take-up rate. See the Technical Appendix for more information.

Ohio PERS, which allows one plan change, takes a somewhat different approach. Members transferring from the DC plan to the DB or combined plan, and combined plan members transferring to the DB plan, have the option to purchase service in the new plan using their old plan assets. Frozen DB benefits are based on salary and service during DB membership only.

In Ohio, out of a total of over 650,000 eligible members, only 1,623 members have opted for a do-over since 2003. Thus, with an average of less than three-in-1,000 eligible employees choosing to change their retirement plan, it is clear that Ohio's do-over option is not very popular. This suggests that the vast majority of public employees, at least within Ohio, are satisfied with their initial decision. See the Technical Appendix for more information.

IMPLICATIONS

When given the choice between a primary DB or DC plan, public employees overwhelmingly choose the DB plan. This suggests that DB plans are more attractive than DC plans to public employees. This is not surprising, as research has shown that public employees tend to favor DB plans in general.[32]

In the final analysis, it's a question of both the amount of potential retirement income that employees are likely to receive from the choice of retirement plan and the value of a guarantee of lifetime retirement income from a professionally managed asset portfolio. The accumulation of contributions and investment earnings determines available retirement income in the DC plan while the formula, service and salary determines retirement income in the DB plan. A plan that maximizes investment earnings and pools longevity risk over many employees maximizes the benefits provided by contributions. Public employees seem to favor plans that provide lifetime income.

While there is not much experience on how many public employees with DC plans have been able to make their assets last a lifetime, the experience in West Virginia suggests that this could be quite challenging for some workers. Unfortunately, the consequences of outliving one's assets are severe. DC plans rarely measure whether assets accumulated will provide adequate retirement income. It remains an open question to understand how public (and private) sector employees with DC plans can be sufficiently educated and empowered to navigate the risks of pre-retirement accumulation, as well as post-retirement distribution.

Although employers have traditionally taken on most of the risk in DB plans and employees have taken on most of the risks in DC plans, the experience of some states suggests that risks can be shared between employers and employees. Examples include the combined DB/DC plans in Washington, Oregon, and Ohio, as well as certain DB plans in which any increases in contribution rates are shared by employees. The combination plan in Utah shifts the DB funding risk from the employer to the employees.

CONCLUSION

State and local DB pension plans provide a critical source of reliable income for more than 25 million Americans, including ten million retirees and 15 million active employees.[33] These plans are a cost effective way to provide broad-based coverage, secure money for retirement, a lifetime income, and economic protections for spouses for our nation's police officers, firefighters, schoolteachers, and other public servants.

A handful of states offer public employees a choice between primary DB and DC plans. This paper analyzes the choices made by employees in these states, and finds that:

- When given the choice between a primary DB or DC plan, public employees overwhelmingly choose the DB pension plan, even in environments where the preference of legislative policy makers is to encourage increased choice of the DC plan.

- DC plans are less cost efficient than DB plans, due to lower net investment returns, and the lack of longevity risk pooling.

- DC plans typically lack supplemental benefits such as death and disability protection. Some plans have attempted to address these discrepancies, but these provisions require extra contributions that are not deposited to the members' DC accounts.

- Making a complete shift from a DB to a DC structure does nothing in and of itself to close any existing DB funding shortfalls, and can actually increase near-term costs. The experience in West Virginia finds that employees with an initial DC benefit overwhelmingly chose the DB plan when offered.

- The combined plan for new employees in Utah provides a unique case study, in that it has shifted some of the DB funding risk from the employer to employees.

The experience in the public sector continues to indicate that public employees value their DB pension benefits quite highly. This fact, coupled with the fact that DB pensions remain the most cost-effective way to fund lifetime retirement benefits, suggests that the public sector, which has made significant reforms to public retirement systems in all states, remains unlikely to mimic the trend away from DB pensions witnessed in the private sector. The public sector workforce has a median tenure rate that is twice that experienced in the private sector. Employers in the public sector can continue to enjoy the workforce management capacities that DB pensions offer to recruit and retain workers while delivering predictable retirements.

A1. **State Systems Referenced**

System	Current plan	Effective date
Alaska PERS & TRS	DC	July 1, 2006
Colorado PERA	DB/DC choice	January 1, 2006
Florida RS	DB/DC choice	July 1, 2002
Michigan PSERS	DB/DC/combined choice	July 1, 2010
Montana PERS	DB/DC choice	July 1, 2002
Nebraska PERS	Cash Balance	January 1, 2003
North Dakota PERS	DB/DC choice (limited group)	January 1, 2000
Ohio PERS	DB/DC/combined choice	January 1, 2003
Ohio STRS	DB/DC/combined choice	July 1, 2001
Oregon PERS	Combination DB/DC	August 29, 2003
South Carolina RS	DB/DC choice	July 1, 2001
Utah RS	Combined/DC choice	July 1, 2011
Washington PERS 3	Combined DB/DC or DC choice	June 1, 2003
Washington TRS 3	Combined DB/DC or DC choice	July 22, 2007
West Virginia TRS	DB	July 1, 2005

Systems with Supplemental Contributions

The following systems have contributions paid as a percentage of DC member salaries that are not credited to DC member accounts. Supplemental contributions required to fund DB liabilities show that introducing a DC plan does not reduce the unfunded liabilities of the existing DB plan.

Colorado PERA

- Amortization Equalization Disbursement (AED): The total AED percentage for 2017 for state employees is 5 percent of pay, while the total AED percentage for teachers is 4.5% in 2017.
- Supplemental Amortization Equalization Disbursement (SAED): The total SAED percentage for 2017 is 5 percent of pay for both state employees and teachers, and is scheduled to increase 0.5% in 2018 to 5.5% for teachers.

- In Colorado, the AED and SAED are both contributions to the DB plan to account for adverse selection. Both are applied to both DB and DC payroll. The AED is paid by employers. The SAED, although technically an employer contribution, is considered to be an employee contribution because it comes out of the employee compensation package.

Florida RS

- To fund supplemental disability benefits for DC members, a contribution ranging from 0.25% of DC member pay for general members to 1.33% of DC member pay for special risk members is paid by employers into a separate side account.
- Employers contribute 0.04% of pay to fund communication and administration.
- In Florida, a single blended contribution rate is paid by employers as a percent of both DB and DC member pay. As of July 1, 2016 there are unfunded DB liabilities. Partially because of this, blended rates paid by employers are greater than the contribution that goes into members' DC accounts.

Michigan PSERS

- In Michigan, an amount is contributed to the legacy DB plan that is based on payroll.

Ohio PERS

- A contribution of 1.5% of pay for members in the all DC plan is made to the DB plan by the employer as of January 2017 as a "mitigation rate." The rate is scheduled to increase to 2 percent in January 2018. The board reviews the mitigation rate annually, and it can vary between 0 percent and 6 percent. The highest level to date is 1.5%.

Ohio STRS

- 4.5% of pay from employer contributions for all alternative retirement plan (ARP) members is used to pay for the unfunded liabilities of the DB plan. The mitigating rate is scheduled to change to 4.47% on July 1, 2017. HB 520 caps the mitigating rate at 4.5% and requires that the rate be reviewed every five years.

South Carolina RS

- Of the total employer contribution made for the South Carolina Retirement System (SCRS), each employer contributes five percent directly to participant accounts and the remainder is remitted to the retirement system. SCRS may retain from this employer contribution an amount as determined by the director to defray any reasonable expenses incurred in performing services regarding the plan. Table A2 summarizes contribution levels.

Utah RS

- Public employees who opt into the combination plan receive an employer contribution of 10 percent of annual salary, which is split between the DB pension and the DC 401(k). The DB pension rate is paid first, and any remainder from the 10 percent contribution is contributed to the 401(k) plan. If the DB pension rate is above 10 percent, the employee must cover the remainder. Additionally, Utah has a percentage of payroll contribution that applies to all covered payroll, which is currently about 9 percent of salary, to pay for the legacy cost of the DB plan.

A2. **South Carolina Employer Contributions**

Fiscal Year	% Allocated to Member	% Retained by SCRS	Total Employer Contribution
2006	5.000%	2.55%	7.55%
2007	5.000%	3.050%	8.050%
2008	5.000%	4.060%	9.060%
2009	5.000%	4.240%	9.240%
2010	5.000%	4.240%	9.240%
2011	5.000%	4.240%	9.240%
2012	5.000%	4.385%	9.385%
2013	5.000%	5.45%	10.450%
2014	5.000%	5.45%	10.450%
2015	5.000%	5.75%	10.750%

Further System Details

The following section provides a brief summary of information relevant to this article for each system.

Alaska

Starting July 1, 2006, Alaska's public employee and teachers defined benefit plans are closed. New hires will go into the defined contribution plan.

The default percent of pay contribution rates are 5 percent employer and 5 percent employee in PERS and 5 percent employer and 8 percent employee in TRS.

Alaska teachers do not participate in Social Security and many Alaska public employers, like the state of Alaska, have opted out of Social Security participation.

Colorado Public Employees' Retirement Association (PERA)

Starting Jan. 1, 2006, Colorado allowed new employees (people without a tie to the PERA DB plan within the last year) to choose between the PERA DB plan, the PERA DC plan, and three other state-offered DC plans. In 2008, the Colorado General Assembly expanded choice to include the new employees within the Community College system. The Community College members have the choice between the PERA DB plan and the PERA DC Plan. The three other state-offered DC plans were not available to the Community College employees. In 2009, the Colorado General Assembly passed legislation that moved the state-offered DC plans into the PERA DC plan. Choice for new hires of both the State of Colorado and the Community Colleges is now solely between the PERA DB plan and the PERA DC plan.

Members have a 60-day election window and can then change their minds once between the PERA DB and PERA DC plans either way in years two through five. If a member changes to the DC plan, the member can transfer their money to the DC plan or leave their money in the DB benefit, where it is frozen based on service and salary to the date of the change and the member participates in the DC plan going forward. If the member changes to the DB plan, the member has the option to purchase his or her original time in the DB plan after one year based on actuarial value.

The DB and DC plans require the same employer and employee percentage of pay contributions. The base contribution rate is 8 percent for state and school employees. The base contribution rate for state and teacher employers is 10.15%. The employer contribution rate of 10.15% includes a 1.02% payment to the PERA Healthcare Trust Fund. The AED and SAED supplemental contributions described earlier are in addition to these base contribution rates.

Table A3 is a historical record of the choices of new hires in Colorado PERA.

A3. **Colorado PERA New Hire Choices* (Effective January 1, 2006)**

	DB by default	DB active enrollments	DC active enrollments
2006	37%	48%	14%
2007	39%	43%	18%
2008	58%	29%	13%
2009	53%	33%	15%
2010	33%	55%	12%
2011	28%	59%	13%
2012	25%	63%	12%
2013	32%	57%	11%
2014	26%	63%	11%
2015	31%	58%	11%

**Based on 28,322 new hires.*

Florida Retirement System (FRS)

Starting July 1, 2002, Florida allowed new employees to choose between a DB plan and a DC plan.

Members have an initial election window and can change their minds once at any time before retirement or termination. Details of how the switch is treated are given in the main body of the article.

DC accounts vest 100% at one year of service. DB benefits for members enrolling July 2011 or later vest 100% at eight years of service. Accounts and benefits are not vested before these dates.

Table A4 is a historical record of the choices of new hires in Florida. Florida has an active education campaign. Employers contribute 0.04% of pay to fund communication and administration.

A4. **Florida Retirement System New Hire Choices* (Effective July 1, 2002)**

Fiscal Year Ending 6/30	DB by default	DB active enrollments	DC active enrollments
2003	86%	6%	8%
2004	73%	11%	16%
2005	61%	18%	21%
2006	59%	19%	22%
2007	58%	18%	24%
2008	54%	20%	26%
2009	55%	22%	23%
2010	56%	21%	23%
2011	51%	23%	26%
2012	51%	19%	30%
2013	56%	17%	27%
2014	59%	17%	24%
2015	60%	17%	23%

Michigan PSERS

Starting September 3, 2012 Michigan allowed new employees to choose between a Combination DB plan (the Pension Plus plan) and a DC plan when they are hired.

The employees who choose the Combination plan contribute 3 percent to 6.4% of salary to the cost of the DB benefit. And they also make a contribution of 2 percent of salary. The employer matches employees' DC contributions with 1 percent of salary contributed to members' DC accounts.

DC accounts vest gradually after 4 years of service. DB benefits vest after ten years of service.

Table A5 is a historical record of the choices of new teachers in Michigan since 2012.

A5. **Michigan PSERS New Hire Choices**

Year	DB by default	DB active enrollments	DC active enrollments
2012	38%	45%	17%
2013	73%	7%	20%
2014	58%	19%	23%
2015	46%	29%	25%

North Dakota Public Employees Retirement System (NDPERS)

North Dakota allows non-classified state employees to choose between a DB combination plan and a DC plan, although all employees must enroll in the DB combination plan before they are allowed to switch to the DC plan. As only non-classified state employees are eligible, there were only 178 active members in the DC plan as of June 30, 2016, after a special law allowed employees who chose DC plan to switch to the DB combination plan.

Members have six months after hire to make a one-time irrevocable decision between the DB combination plan and the DC plan.

The DB combination and DC plans require the same employer and employee percentage of pay contributions. Employees contribute 7 percent of pay, with employers "picking up" 4 percent of pay on a pre-tax basis and employees paying the remaining 3 percent. Employers also contribute 7.12% of pay.

Since 2010, only a small number of employees in North Dakota elected the DC plan and recently all participants in the DC plan were offered a one time option to switch to DB plan, which many chose to use.

A6. **North Dakota PERS New Hire Elections (January 2001–December 2015;* Effective January 1, 2000)**

	DB by default	DC active enrollments
1/2001 – 6/2008	88%	12%
2008	93%	7%
2009	88%	12%
2010*	98%	2%
2011	94%	6%
2012	100%	0%
2013	96%	4%
2014	97%	3%
2015	97%	3%

Ohio Public Employees Retirement System (OPERS)

Starting Jan. 1, 2003, OPERS allowed new employees to choose between an all-DB plan (the Traditional Pension Plan), an all all-DC plan (the Member-Directed Plan), and the Combined Plan. In the Combined Plan, employer contributions fund DB benefits and all member contributions are credited to DC accounts.

Members can change their minds about their choice once at any time during their career. Changes are permanent. Members of the DC plan that switch to the DB or Combined plan can transfer their contributed service. An OPERS actuary determines the cost of the service credit, which can be paid for with the vested portion of the member's old account. If the vested portion of the old account is worth less than the service credit, service credit can be awarded on a prorated basis or the remainder of the cost can be paid separately.

The employer contribution is 14% of pay and the employee contribution is 10 percent of pay for all three plans (DB, DC, or Combined). Members in the all-DC and combined plans have all employee contributions credited to their DC accounts. However, a portion of the employer contribution is used to fund retiree health benefits (4.5% of pay in 2010). Also, the mitigation rate (0.77% of pay for the alternative retirement plan and 1 percent of pay for the DC and Combined plans) comes out of the 14 percent employer contribution and is not credited to DC accounts.

Table A7 is a historical record of the choices of new hires in OPERS.

A7. **Ohio PERS New Hire Choices* (Effective January 1, 2003)**

	DB by default	DB active enrollments	DC active enrollments	Combined plan active enrollments
2004	84%	11%	3%	2%
2005	84%	10%	3%	3%
2006	83%	12%	3%	2%
2007	82%	13%	3%	2%
2008	81%	14%	3%	2%
2009	84%	12%	3%	1%
2010	78%	17%	4%	1%
2011	80%	15%	4%	1%
2012	77%	19%	3%	1%
2013	77%	18%	3%	2%
2014	77%	18%	4%	1%
2015	77%	19%	3%	1%
2016	76%	20%	3%	1%

State Teachers Retirement System of Ohio (STRS)

Starting July 1, 2001, STRS allowed new employees to choose between an all-DB plan, an all-DC plan, and a Combined plan. In the combined plan, employer contributions fund DB benefits and all member contributions are credited to DC accounts.

Members have 180 days to choose a plan. If a choice hasn't been made by the deadline, members are defaulted into the all-DB plan. After the member is put in the all-DB plan either by default or by active election, he or she cannot elect out. Members who choose the DC or combined plan have an option to change to the DB plan or either the DC or combined plan during their fifth year. Members who don't select a change are left in the plan they originally selected. If members change into the all-DB plan, they forfeit their DC accounts and are treated as if they had been in the all-DB plan since hire. There are no changes after the end of the fifth fiscal year of participation after hire.

The employer contribution is 14% of pay and the employee contribution is 14 percent of pay for all three plans. Employers to members in the combined plan pay their full 14 percent into the members' DB accounts, while the employees pay 2 percent into the DB account and 12 percent into the DC account. However, a portion of the employer contribution to an alternate retirement plan is used to fund unfunded liabilities for the all-DB plan (4.50% of pay until July 2017, when it changes to 4.47% of pay).

Table A8 is a historical record of the choices of new hires in STRS of Ohio.

Table A8. **Ohio Teachers New Hire Choices* (Effective July 1, 2001)**

	DB by default	DB active enrollments	DC active enrollments	Combined plan active enrollments
7/01 – 6/04	69%	15%	10%	6%
7/04 – 6/05	70%	15%	11%	4%
7/05 – 6/06	72%	13%	11%	4%
7/06 – 6/07	72%	13%	11%	4%
7/07 – 6/08	71%	14%	11%	4%
7/08 – 6/09	71%	15%	10%	4%
7/09 – 6/10	81%	10%	7%	2%
7/10 – 6/11	79%	10%	9%	2%
7/11 – 6/12	77%	11%	9%	3%
7/12 – 6/13	76%	12%	9%	3%
7/13 – 6/14	80%	10%	8%	2%
7/14 – 6/15	76%	11%	9%	4%
7/15 – 6/16	78%	10%	8%	4%

Oregon Public Service Retirement Plan (OPSRP)

Since August 29, 2003, all new hires are placed into a combined pension plan with two components: the defined benefit pension program and the defined contribution Individual Account Program (IAP).

The pension program provides a defined benefit equal to 1.5% of final average earnings for general employees and 1.8% for public safety employees, for every year of service and is funded entirely by employer contributions.

The IAP is funded entirely by the employee contributions, which are 6 percent of pay. All IAP assets are invested in the same portfolio as the DB assets; there is no difference. Implementation of mandated target date funds are currently under consideration as an alternative policy at the time of this study's publication. Employees have no choice in how IAP assets are invested. As a result, the members' DC accounts earn the same returns, positive or negative, as the DB assets. Earnings are credited annually to member accounts. Administrative fees are deducted from the fund's earnings as part of the annual crediting process. Members receive an annual statement after interest is credited each year.

South Carolina Retirement Systems

South Carolina allows new employees of State agencies, institutions of higher education, and employees of K-12 schools to choose between a DB plan (South Carolina Retirement System (SCRS)) and a DC plan (State Optional Retirement Program (SORP)). Employees of municipalities, counties or special purpose districts cannot participate in the DC plan. This arrangement was made effective over the period from July 1, 2001, to July 1, 2003, varying by group.

DC members choose between four authorized investment providers. Members must choose investment options from their chosen investment provider. Members may change investment providers during the annual open-enrollment period subject to the investment provider's contractual limitations.

Members have a 30-day election window after hire to choose between the DB plan and the DC plan. After the first year but before the end of the fifth year, members can change from the DC plan to the DB plan. Members cannot change from the DB plan to the DC plan. If a member changes to the DB plan during this five-year period, the member has the option to purchase his or her original time in the DB plan. The cost is 16 percent of the member's highest qualified career salary for each year of service, or 35 percent for nonqualified service. The member has the option, but is not required, to use his or her DC account for these service purchases.

The DB and DC plans require the same employee percentage of pay contributions. Employees contribute 8.66% of pay. SCRS employers currently contribute 11.41% of pay to retirement and SORP employers contribute 6.41% of pay to retirement. Both SCRS and SORP contribute an additional 5.33% insurance surcharge, bringing their total employer rates to 16.74% and 11.74% respectively. Participants are immediately vested in their accounts.

Table A9 is a historical record of the choices of new hires in South Carolina. Like most other systems, the DB plan is the default election. It is interesting to note that the percent of new hires electing DC varies widely by group. The percent of higher education employees choosing DC has varied from 31 percent to 37 percent, whereas the DC choice for other groups has only varied from 10 percent to 16 percent.

Table A9. **South Carolina Retirement Systems Percent of New Hires Electing DC* (Effective July 2, 2001, and July 1, 2003)**

Fiscal Year Ending 6/30	Higher Education	K - 12 Schools	State Agencies	Overall
2005	32%	14%	11%	17%
2006	34%	14%	12%	18%
2007	37%	15%	13%	19%
2008	35%	16%	13%	20%
2009	33%	14%	11%	18%
2010	31%	12%	10%	17%
2011	33%	11%	13%	18%
2012	33%	11%	11%	17%
2013	37%	13%	14%	19%
2014	36%	15%	11%	19%
2015	36%	16%	11%	19%

Washington State Department of Retirement Systems

Starting March 1, 2002, Washington allowed new hires in the Public Employees' Retirement System (PERS) to choose between an all-DB plan (Plan 2), and a combined plan (Plan 3). In the combined plan, employer contributions fund DB benefits equal to 1 percent of final average earnings for each year of service and all member contributions are credited to DC accounts. Starting July 1, 2007, new hires in the Teachers' Retirement System (TRS) and the School Employees' Retirement System (SERS) were given the same choice between Plan 2 and Plan 3.

Members have 90 days after hire to make a one-time irrevocable decision between the all DB plan and the combined plan.

At the same time the plan election is made in the first 90 days, members in the combined plan (Plan 3) also choose between six employee contribution-rate options. Once the employee contribution-rate option is chosen, it cannot be changed as long as the member remains with the same employer. If members separate from the employer, they may change their contribution rate with the next employer. All employee contributions are credited to the DC account. The six employee contribution options in the combined plan are as follows:

- Option A: 5 percent of pay contribution at all ages
- Option B: 5 percent to age 35, 6% at ages 35 to 44, 7.5% at ages 45 and up
- Option C: 6 percent to age 35, 7.5% at ages 35 to 44, 8.5% at ages 45 and up
- Option D: 7 percent of pay contribution at all ages
- Option E: 10 percent of pay contribution at all ages
- Option F: 15 percent of pay contribution at all ages

Employees who do not make an election in the first 90 days after hire are placed in the combined plan (Plan 3) with employee contribution option A. Approximately 65 percent of combined plan members are in option A, with the remainder spread fairly evenly between the other five contribution options.

One of the DC investment options is the Total Allocation Portfolio (TAP), which mirrors the investments in the state DB plan and therefore earns the same returns, and the other is the Retirement Strategy Fund (RSF), which is a target date fund. The TAP is the default investment option for those who joined Plan 3 before July 22, 2011, and the RSF is the default for those who joined on or after July 22, 2011. The target date funds allocate investments without the member's involvement and automatically change the asset mix as the member moves closer to retirement.

A10. **Washington State PERS and TRS Choice and Default Counts by Year**

	PERS 2 active enrollments	PERS 3 active enrollments	PERS 3 default enrollments	TRS 2 active enrollments	TRS 3 active enrollments	TRS 3 default enrollments
2002	64%	18%	18%			
2003	63%	15%	22%			
2004	63%	17%	19%			
2005	64%	17%	19%			
2006	66%	17%	16%			
2007	65%	17%	18%	39%	46%	16%
2008	62%	17%	20%	42%	37%	21%
2009	64%	15%	21%	45%	33%	21%
2010	63%	14%	23%	48%	30%	23%
2011	62%	14%	23%	48%	30%	22%
2012	62%	15%	23%	49%	31%	20%
2013	63%	14%	23%	55%	35%	19%

West Virginia Teachers Retirement System

The following chronology of the West Virginia TRS fills in some holes not described in the article.

- 1941: West Virginia TRS was established as a DC plan.
- 1960s and 1970s: DB benefits were added to counter the inadequate DC benefits, but the benefits were never properly funded.
- 1991: The DC plan (TDC) was established for new hires in response to funding problems, and 4,500 former DB participants also switched from the DB to DC.
- 2003: Many of the 4,500 who switched felt misled and said they could not afford to retire. Other DC members were also not satisfied.
- 2005: The state decided that a given level of benefits could be funded for a lower cost through a DB plan. Average DC returns had been lower than DB returns in both up and down markets. Changing to a DC plan did not solve the state's funding problems. All members hired after July 1, 2005, go into the DB plan instead of the DC plan. West Virginia projected a $1.2 billion savings in the first 30 years due to moving new entrants from the DC to the DB plan.
- 2006 and 2007: Special appropriations of $290.1 million in FY2006 and $313.8 million in FY2007 were deposited into TRS. In addition, West Virginia completed a tobacco bond securitization in FY2007 and deposited $807.5 million of those proceeds into TRS as another special appropriation. All these amounts were in addition to the regular contribution determined under the ARC, which was converted to a level dollar amortization (from level percentage of payroll).

- 2008: DC members are given the option to switch to the DB plan. Of those DC members, 78.6% (14,925 members) chose to switch to the DB plan. Surprisingly, the switch, which was expected to cost the state up to $78 million before the elections were made, is now expected to save the state about $22 million. Fewer older TDC members than expected transferred. More young TDC members than expected transferred. 50% of those over 70 transferred; 69% of those age 65 to 69 transferred; 81 percent of those 45 to 64 transferred; and 76 percent of members under age 40 transferred.

Table A11. **West Virginia Teachers' DC Returns Compared to TRS Returns**

Year ending June 30	DC plan	DB plan
2001	-2.60%	-0.25%
2002	-3.76%	-2.94%
2003	4.84%	4.75%
2004	8.83%	15.08%
2005	6.33%	10.56%
2006	6.67%	9.55%
2007	11.85%	17.43%
2008	-3.28%	-7.64%
2009	-12.16%	-16.77%
2010	9.16%	15.20%
10 Yr Average	**2.32%**	**3.93%**

ENDNOTES

1 U.S. Census Bureau, 2015, *Annual Survey of Public Pensions: State-and Locally-Administered Defined Benefit Data Summary Brief: 2015*, Washington, DC: U.S. Census Bureau, https://www.census.gov/content/dam/Census/library/publications/2016/econ/g15-aspp-sl.pdf.

2 B. Almeida and I. Boivie, Recruitment and retention in the public sector: The role of pensions, *Labor and Employment Relations Association, Proceedings of the 61st Annual Meeting*, pp. 154-159.

3 M. Olleman and I. Boivie, 2011, "Decisions, Decisions: Retirement Plan Choices for Public Employees and Employers," National Institute on Retirement Security, http://www.nirsonline.org/storage/nirs/documents/Decisions%20Decisions/final_decisions_decisions_report.pdf.

4 C. Browning, T. Guo, Y. Cheng, and M. S. Finke, 2016, "Spending in Retirement: Determining the Consumption Gap," *Journal of Financial Planning* 29 (2): 42–53, https://www.onefpa.org/journal/Pages/FEB16-Spending-in-Retirement-Determining-the-Consumption-Gap.aspx.

5 C. Copeland, 2007, "How Are New Retirees Doing Financially in Retirement?" EBRI Issue Brief. No. 302, Washington DC: Employee Benefit Research Institute; D. Love, P.A. Smith and L. McNair, 2007, "Do Households Have Enough Wealth for Retirement?" *Finance and Economics Discussion Series*, 2007-17, Washington, DC: Federal Reserve Board.

6 P. Perun, 2007, "Putting Annuities Back into Savings Plans," In Ghilarducci and Weller, eds. *Employee Pensions: Policies, Problems, and Possibilities*, Champaign IL: Labor and Employment Relations Association.

7 W. Wiatrowski, 2009, "The Structure of State and Local Government Retirement Benefits," 2008, Washington, DC: Bureau of Labor Statistics, https://www.bls.gov/opub/mlr/cwc/the-structure-of-state-and-local-government-retirement-benefits-2008.pdf; U.S. Department of Labor, 2006, Bureau of Labor Statistics, Employee Benefits Survey, *Retirement Benefits: Access, Participation, and Take-Up Rates*, https://www.bls.gov/ncs/ebs/benefits/2016/benefits_retirement.htm.

8 For a greater discussion for the reasons behind the private sector pension decline, as well as the reasons for the maintenance of public sector coverage, please see I. Boivie, 2011, *Who Killed the Private Sector DB Plan?*, Washington, DC: National Institute on Retirement Security.

9 D. Oakley and K. Kenneally, 2017, *Retirement Security 2017: Americans' Views of the Retirement Crisis*, http://www.nirsonline.org/index.php?option=content&task=view&id=956.

10 D. Oakley and K. Kenneally, 2017, op cit.

11 D. Oakley and K. Kenneally, 2015, *Retirement Security 2015: Americans' Views of the Retirement Crisis*, http://www.nirsonline.org/storage/nirs/documents/2015%20Opinion%20Research/final_opinion_research_2015.pdf.

12 Information on the Florida choice survey provided by Dennis MacKee.

13 Forthcoming D. Oakley, Palm Beach Case Study.

14 A.H. Munnell, J.P. Aubry, J. Hurwitz, and L. Quinby, 2011, "A Role for Defined Contribution Plans in the Public Sector," State and Local Pension Plans No. 16, Center for Retirement Research at Boston College, Chestnut Hill, MA.

15 NIRS calculations from U.S. Census Bureau, 2013 Survey of Public Pensions.

16 J. Erickson and D. Madland, 2014, "Fixing the Drain on Retirement Savings", Center for American Progress, Washington, DC.

17 J. L. Ellement, L. Lucas, and J. Veneruso, 2012, "The Long-Term Impact of Fees on DC Participant Balances," Benefits Quarterly, Third Quarter 2012.

18 Morningstar, 2013, "Target Date Series Research Paper: 2014 Survey," Morningstar Fund Research.

19 W. Fornia and N. Rhee, 2014, "Still a Better Bang for the Buck: An Update on the Economic Efficiencies of Defined Benefit Pension Plans," Washington, DC: National Institute on Retirement Security.

20 Benartzi and Thaler, 2007, op cit.; Benartzi, 2007, op cit.; R. Kinnel, 2014 (Feb. 27), "Mind the Gap 2014," Morningstar Advisor, http://www.morningstar.com/advisor/t/88015528/mind-the-gap-2014.htm.

21 For an overview of research on individual investor behavior and under-performance, see B. Barber and T. Odean, 2011 (Sep.), "The Behavior of Individual Investors," Working Paper, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1872211.

22 Morningstar, 2013, op cit.

23 U.S. Congress, 2007, House of Representatives, Committee on Education and Labor, *Are Hidden 401(k) Fees Undermining Retirement Security? Hearing before the Committee on Education and Labor*, 110th Congress, 1st sess.

24 W. Fornia and N. Rhee, op cit.

25 C. Weller and S. Jenkins, 2007, "Building 401(k) Wealth One Percent at a Time: Fees Chip Away at People's Retirement Nest Eggs," CAP Economic Policy Report, Center for American Progress, Washington, DC. And W. Fornia and N. Rhee, 2014, *Still a Better Bang for the Buck: An Update on the Economic Efficiencies of Defined Benefit Pension Plans*, Washington, DC: National Institute on Retirement Security.

26 W. Fornia and N. Rhee, op cit.

27 Ibid.

28 A. Monahan, 2010, Public pension plan reform: The legal framework. Minnesota Legal Studies Research No. 10-13, *Education, Finance, and Policy 5*.

29 Interview with Harry Mandel, West Virginia Consolidated Public Retirement Board Actuary.

30 Interview with Harry Mandel, op cit.

31 NIRS, 2015, "Case Studies of State Pension Plans that Switched to Defined Contribution Plans," http://www.nirsonline.org/storage/nirs/documents/Case%20Studies/public_pension_resource_guide_-_case_studies_of_state__pension_plans_that_switched_to_defined_contribution_plans.pdf; Consolidate Public Retirement Board, 2017, "Comprehensive Annual Financial Report 2016, West Virginia Consolidated Public Retirement Board," http://www.wvretirement.com/Forms/2016-6-cafr.pdf.

32 B. Almeida, and I. Boivie, 2009, The staying power of pensions in the public sector, *CPER Journal 195*. May, 5-11; A.H. Munnell, K. Haverstick, and M. Soto, 2007, "Why Have Defined Benefit Plans Survived in the Public Sector?" SLP No. 2. Chestnut Hill, MA: Center for Retirement Research at Boston College.

33 U.S. Census Bureau, 2016, "State and Local Government Employee-Retirement Systems," Washington, DC: U.S. Census Bureau.

Milliman, Inc. is among the world's largest independent actuarial and consulting firms, with 59 offices across six continents. Through consulting practices in employee benefits, health care, investment, life insurance and financial services, and property and casualty insurance, Milliman serves the full spectrum of business, financial, government, union, education, and nonprofit organizations. In addition to consulting actuaries, Milliman's body of professionals include numerous other specialists, ranging from clinicians to economists.

The **National Institute on Retirement Security** is a non-profit research institute established to contribute to informed policy making by fostering a deep understanding of the value of retirement security to employees, employers, and the economy as a whole. NIRS works to fulfill this mission through research, education, and outreach programs that are national in scope.

Milliman

NATIONAL INSTITUTE ON
Retirement Security
Reliable Research. Sensible Solutions.

www.milliman.com

www.nirsonline.org