



WHY HAVE SOME STATES INTRODUCED DEFINED CONTRIBUTION PLANS?

*By Alicia H. Munnell, Alex Golub-Sass, Kelly Haverstick, Mauricio Soto, and Gregory Wiles**

INTRODUCTION

Although defined benefit plans dominate the state and local sector, in the last decade twelve states have introduced some form of defined contribution plan. The degree of compulsion varies among these states from mandatory participation in a defined contribution plan for new employees, to mandatory participation in both a defined benefit and defined contribution plan, to having the defined contribution plan only as an option.

This *brief* describes this flurry of defined contribution activity, presents data on participation and assets to put the flurry into perspective, and identifies the factors that led to the changes occurring in the states where they did.

The most important explanation turns out to be political rather than economic. States where the same political party controlled the legislature and the governorship and that party was Republican were the most likely to introduce a defined contribution plan. The results also suggest that plans with a high percentage of union members and those with sizeable employee contributions are less likely to add a defined contribution plan component. Interestingly, states without Social Security coverage, which provides a basic level of defined benefit protection, are not deterred from shifting to a mandatory defined contribution plan.

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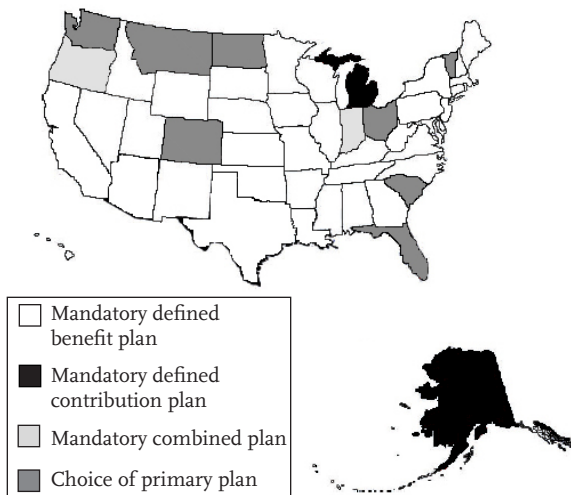
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DEFINED CONTRIBUTION ACTIVITY

Most state and local workers are covered by a traditional defined benefit plan. These workers often have a supplementary 457 defined contribution plan that allows them to put aside a portion of their pay on a tax-deferred basis. These supplementary plans are not the topic of this *brief*.¹ Rather the focus is on states where the nature of the primary plan has changed.

Each change is unique, with its own history and special provisions, but one useful way to classify them is by the extent to which they move employees away from a defined benefit plan. Only two states — Michigan and Alaska — have plans that require all new hires to join the defined contribution plan (see Figure 1).² Two states — Oregon and Indiana — have adopted “combined” plans, where employees are required to participate in both a defined benefit and a defined contribution plan. Another eight states have retained their defined benefit plan and simply offer the defined contribution plan as an option to their employees.³

FIGURE 1. ADOPTION OF DEFINED CONTRIBUTION PLANS, BY STATE, 2007



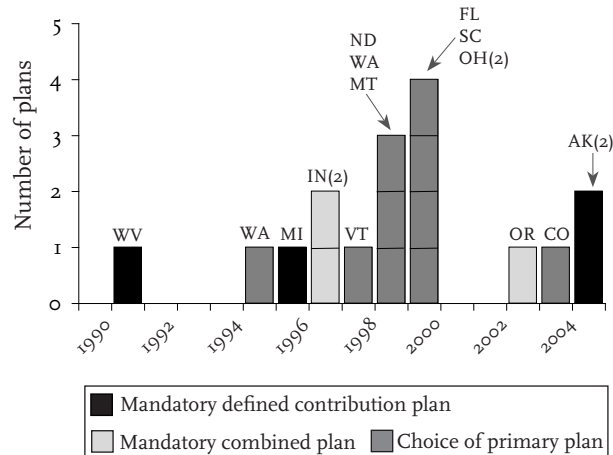
Note: For specific definitions of the classifications used in this figure, see endnote 4.

Sources: Various retirement system's annual reports and websites of state legislatures.

The timeline of the introduction of these defined contribution plans is also interesting (see Figure 2). Some of the changes may be a response to economics

or politics, but the activity at the end of the nineties was likely also a response to the fantastic performance of the stock market.⁵

FIGURE 2. INTRODUCTION OF STATE DEFINED CONTRIBUTION PLANS, BY YEAR



Note: For specific definitions of the classifications used in this figure, see endnote 4. The West Virginia Teachers plan, which became a primary defined contribution plan in 1991, switched back to a primary defined benefit plan in 2005. Sources: Various retirement system's annual reports and websites of state legislatures.

Since the plans are relatively new, the compulsory plans apply only to new hires, and the others are optional, the number of participants and amount of assets in defined contribution plans are modest.⁶ To date, participants account for less than 4 percent of all state and local workers and assets amount to less than 1 percent of total state and local pension assets (see Appendix Table A-1).⁷

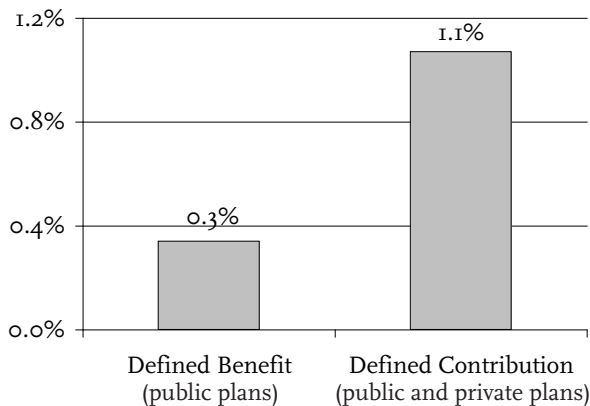
IS SWITCHING LIKELY TO SAVE MONEY?

For any given level of benefits, defined contribution plans generally have higher investment and administrative expenses than defined benefit plans. So introducing a defined contribution plan is unlikely to reduce plan costs. And given the already high level of contributions by employees, states would find it difficult to shift more of the cost from the government to the participant.

ADMINISTRATIVE COSTS

Public plans are relatively free from regulatory costs. The administrative expenses associated with the Employee Retirement Income Security Act (ERISA) of 1974 do not apply in the public sector. And since public sector plans are not insured by the Pension Benefit Guaranty Corporation, governments are not responsible for premium payments. The freedom from regulatory costs combined with the economies of scale achieved by large state pension funds has kept the cost of administering public sector defined benefit plans very low. According to the Census of Governments, the weighted average administrative cost (including cost of administration and investment management) for the nation's public defined benefit plans is 0.34 percent of assets (see Figure 3).

FIGURE 3. ADMINISTRATIVE EXPENSES BY TYPE OF PLAN, 2006



Sources: U.S. Census Bureau (2006), and HR Investment Consultants (2007).

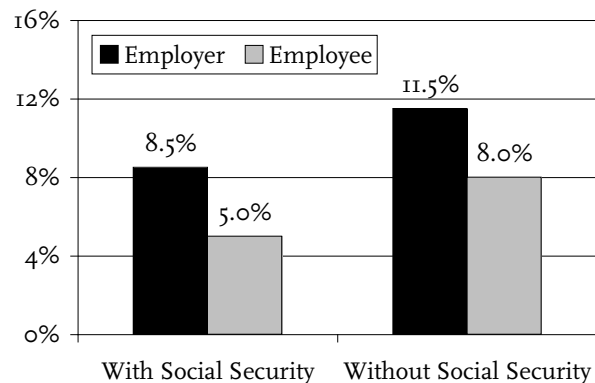
The costs of administering defined contribution plans are considerably higher. Defined contribution plans maintain individual accounts and typically update these accounts daily. In addition, most defined contribution plans use mutual funds or similar instruments as investment options — with an average expense ratio that ranges from about 0.60 percent for bond mutual funds to about 0.75 percent for a stock fund.⁸ As a result, the annual cost of a defined contribution plan generally exceeds one percent of assets.

Some studies estimate considerably higher costs for public defined contribution plans. For example, the Illinois Municipal Retirement Fund (1999) estimated that replacing the defined benefit plan with a defined contribution plan would increase the administrative costs from 0.44 percent of assets per year to about 2.25 percent.

EMPLOYEE CONTRIBUTIONS

Even if aggregate costs increased, taxpayers could hope for relief if by switching to a defined contribution plan they could transfer the burden from the government employer to the individual employee. (Transferring the contribution burden to the employee provided a major economic incentive to move from defined benefit to 401(k) plans in the private sector.⁹) But such an outcome is difficult to achieve in the public sector where employee contributions to defined benefit pensions are already high. In states where employees are covered by Social Security, the median contribution rate is 5 percent (see Figure 4). In states without Social Security, the median employee contribution rate is 8 percent of payroll. Therefore, state and local governments might find it challenging to shift more of the cost from the government to the participant.

FIGURE 4. STATE AND LOCAL EMPLOYER AND EMPLOYEE MEDIAN CONTRIBUTION RATES, 2006



Source: Brainard (2007).

OTHER ARGUMENTS FOR DEFINED CONTRIBUTION PLANS

Some of the other arguments offered for defined contribution plans in the public sector are that they are more attractive to new employees, they offer employees the potential to earn higher returns, they solve the funding problem, and they avoid the “moral hazard” associated with state governments not funding benefit promises.

MORE ATTRACTIVE TO NEW EMPLOYEES

Some proponents of defined contribution plans in the public sector contend that they will be more attractive to new and younger workers, who might value the portability of benefits provided by a defined contribution plan.¹⁰ The data to date, however, do not show a groundswell of enthusiasm. As shown in Table I, the percent of new employees electing a defined contribution plan ranges from 6 percent in Ohio to 21 percent in Florida. The outcome is affected by the fact that the majority of the plans cited automatically default employees into the defined benefit plan if they do not make a choice. Nevertheless, at this stage it would be difficult to argue that the presence of a defined contribution plan was a deciding factor for most people entering public sector employment. However, if even a small portion of workers prefer the features of defined contribution plans, such as portability, offering the plans as an option could serve as a useful recruitment tool.¹¹

TABLE I. PERCENT OF NEW EMPLOYEES ELECTING A DEFINED CONTRIBUTION PLAN

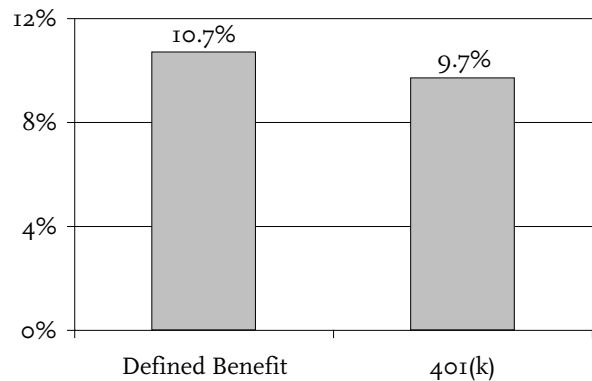
Plan	Percent	Does plan have default into defined benefit?
Colorado PERA	12 %	Yes
Florida RS	21	Yes
Montana PERS	10	No
Ohio STRS	19	Yes
Ohio PERS	6	Yes
South Carolina	18	No

Source: Olleman (2007).

OFFER EMPLOYEES POTENTIAL TO EARN HIGHER RETURNS

Another argument in favor of defined contribution plans is that people will be able to control their own investments. Thus, defined contribution plan participants will be able to match their portfolio to their preference for risk and perhaps earn higher returns. With respect to higher returns, however, such an outcome would contradict the experience in the private sector. Over the period 1988-2004, the return on 401(k) assets has averaged about one percent less than the return on private sector defined benefit assets, even though a greater percentage of 401(k) assets were invested in equities during the stock market boom of the 1990s (see Figure 5).¹²

FIGURE 5. MEDIAN RATES OF RETURN FOR PRIVATE SECTOR DEFINED BENEFIT AND 401(k) PLANS, 1988-2004



Source: Munnell et al. (2006) based on the Department of Labor's Form 5500.

The expectation of higher returns also flies in the face of the experience of Nebraska. In the 1960s, the Nebraska legislature wanted to provide pensions for its state and county workers. But instead of instituting a defined benefit plan similar to that covering teachers and judges, it created a defined contribution plan. In recent years, however, Nebraska officials became concerned that the defined contribution plan was producing lower returns than the defined benefit plans. The Nebraska Public Employees Retirement

Systems reported in a 2002 newsletter that “On average, the investment returns in the School Employees, State Judges and State Patrol defined benefit plans were 11 percent for the past 20 years while state and county employees returned between 6% and 7% on average.”¹³ Faced with such an enormous disparity, the state legislature replaced the defined contribution plan with a cash balance plan — a defined benefit plan where assets are managed by the employer but participants have separate accounts.

The Nebraska experience confirms what has been learned through the 401(k) experience in the private sector: individuals find investing very difficult and generally do not do a very good job.

SOLVE THE FUNDING PROBLEM

In the debate over retirement plans, supporters of defined contribution plans often use the magnitude of the unfunded liabilities to highlight the need for reform. The reality, however, is that, even with a new defined contribution plan, state governments are still left to deal with past underfunding problems. Although new employees will not accrue any benefits under the old plan, the state must still cover the cost of accrued benefits from past service. Thus, even if the introduction of a new plan — either defined benefit or defined contribution — reduces pension costs going forward, such a step does nothing to solve the current funding problem.

AVOID “MORAL HAZARD” OF NOT FUNDING BENEFIT PROMISES

Experts contend that states face incentives to not fully fund their defined benefit plans.¹⁴ Participants, who believe that they will be paid regardless of funding, do not push for government contributions. And politicians are all too happy to address short-term priorities rather than put money aside for long-term funding needs. Similarly, legislatures sometimes make unfunded benefit improvements in good times that further aggravate the funding situation. A defined contribution plan avoids this type of “moral hazard,” as the plans are fully funded by design.

The question is the seriousness of this “moral hazard” problem. Without the funding requirements of ERISA and with the incentives not to fund, one might think that states have not put aside any money to fund future benefits. But, in fact, state plans in the aggregate in 2006 were about 90 percent funded — about as well funded as their private sector counterparts.¹⁵

IMPACT ON PUBLIC EMPLOYEES

Defined benefit and defined contribution plans subject the employee to very different types of risk. A traditional defined benefit plan pays a lifetime annuity at retirement that is generally a percentage of final salary for each year of service. For example, an employee with 20 years of service who accrues 2 percent per year would be entitled to a benefit equal to 40 percent (20 years at 2 percent) of final salary for as long as they live. Most defined benefit pensions in the public sector are also adjusted, at least partially, for inflation after retirement, which substantially increases the value of the stream of payments. The employer bears the investment risk during the worker’s employment and the inflation and longevity risk after retirement. But employees face ‘mobility risk.’ That is, under final earnings plans and plans with delayed vesting, workers who leave public service lose substantial benefits.

Defined contribution plans are like savings accounts. Generally the employee, and often the employer, contributes a specified percentage of earnings into the account. These contributions are invested, usually at the direction of the employee, mostly in mutual funds consisting of stocks and bonds. Upon retirement, the worker generally receives the balance in the account as a lump sum. One important advantage of these plans is that mobile employees do not lose benefits when they shift jobs as their assets can move with them. On the other hand, the employee bears all the investment risk during the accumulation phase as well as longevity and inflation risk after retirement.

For long-service employees, defined benefit plans provide a more secure retirement than defined contribution plans. And state and local employees tend to have longer tenures than their private sector counterparts. Partly for this reason, public sector unions have repeatedly resisted efforts to introduce a defined contribution plan.¹⁶

WHY DID SOME STATES INTRODUCE DEFINED CONTRIBUTION PLANS?

In order to assess why some states adopted defined contribution plans, we undertook an empirical analysis to identify the factors that might affect their decisions. The following discussion first describes the factors considered and then presents the regression results.

POSSIBLE EXPLANATIONS

Possible factors that may either encourage or discourage states from introducing a defined contribution plan include the funded status of the plan, the cost of the plan, the current level of employee contributions, the extent to which participants are unionized, whether government employees are covered by Social Security, and the political climate.

Funding ratio. A low funding ratio in a defined benefit plan could either encourage or discourage the introduction of a defined contribution plan. On the one hand, persistently low levels of funding might highlight the need for action and enhance the probability of introducing a defined contribution plan.¹⁷

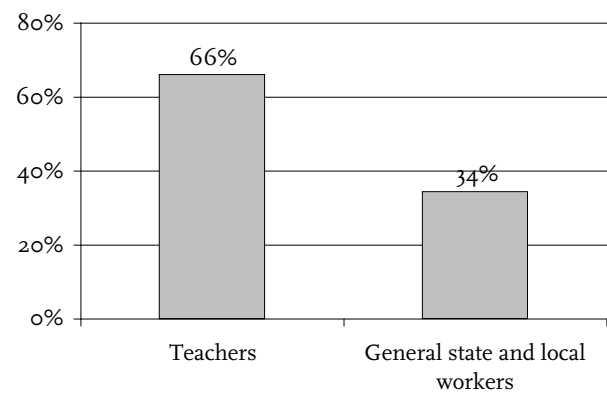
On the other hand, some experts contend that it is harder to switch from a defined benefit to a defined contribution plan when the plan is underfunded.¹⁸ The argument is that the closer the system is to pay-as-you-go, the more expensive the transition. The government would have to contribute both to the defined benefit plan to cover annual benefit costs for current retirees as well as to the new defined contribution plan. This issue arose explicitly in Michigan. When the new defined contribution plan was introduced, the legislation explicitly stated that school employees could not make the transition until the \$3 billion unfunded liability was erased.¹⁹

High cost. States with generous plans might be more likely to introduce a defined contribution plan in an effort to get their costs under control. One measure of generosity of the benefits is the annual accrual rate. That is, typically, an annual benefit in a defined benefit plan is the product of an employee's final average salary, the years of service, and the benefit rate per year — a rate that ranges from about 1.5 percent to 2.5 percent. The hypothesis is that the higher the rate and therefore the greater the cost, the more likely the state is to introduce a defined contribution plan.

Employee contributions. The notion is that the higher the existing level of employee contributions, the less likely the state will be able to shift more of its contributions to the employee. The inability to shift contributions to the employee would reduce the likelihood that a state would introduce a defined contribution plan.

Unionization (Teachers). Public sector unions generally support the retention of defined benefit plans.²⁰ Therefore, the hypothesis is that the greater the degree of unionization, the less likely the state is to switch a plan from defined benefit to defined contribution. The problem is that the only readily available data are the percent of public sector employees who are unionized by state. Unionization, however, varies significantly by type of plan. For example, a far greater percent of teachers are unionized than are general employees (see Figure 6). Therefore, a proxy for the role of unions is whether the plan covers teachers. The hypothesis is that when a plan includes teachers, the state is less likely to introduce a defined contribution plan.

FIGURE 6. PERCENT OF PUBLIC SECTOR WORKERS COVERED BY UNIONS, BY WORKER TYPE, 2004



Sources: Farber (2005); and Hirsch and Macpherson (2007).

Social Security Coverage. Roughly 30 percent of public sector workers are not covered by Social Security. The bulk of uncovered workers are concentrated in twelve states (see Table 2 on the next page). Social Security is a defined benefit plan. Benefits are based on contributions, paid in the form of an annuity, and indexed for inflation after retirement. Social Security is designed to serve as a base to which workers can add through employer-sponsored pensions or individual saving. Our hypothesis is that states where workers do not have this basic level of protection would be less likely to introduce a defined contribution plan, because employees would then be exposed to all the risks associated with retirement planning.

TABLE 2. PERCENT OF STATE AND LOCAL WORKERS NOT COVERED BY SOCIAL SECURITY, 2000

State	Percent not covered
Massachusetts	100%
Nevada	100
Ohio	100
Louisiana	98
Colorado	95
Maine	80
Alaska	73
Illinois	62
Texas	55
Connecticut	52
California	49
Missouri	45

Source: Munnell (2000).

Republican Control. The final consideration is political. Republicans generally espouse the advantages of defined contribution plans in terms of employees' ability to control their own investments and match their assets to their tolerance for risk. Introducing a defined contribution plan when Republicans control the state governorship and legislature is consistent with their political philosophy of individual responsibility for retirement savings.

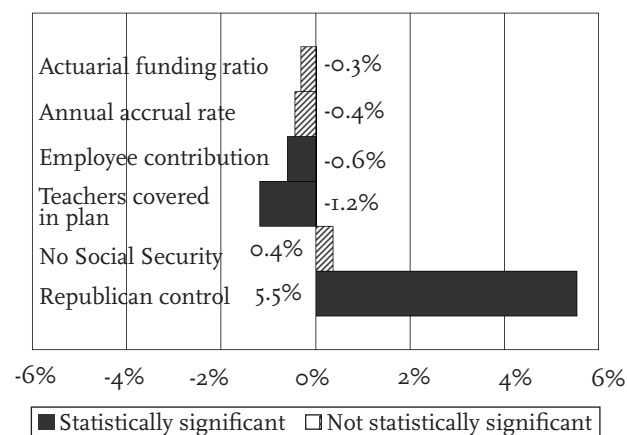
THE RESULTS

The analysis included data on each state-administered plan from 1992 through 2006. The dependent variable was set equal to zero if no action was taken; 1 if the state introduced a defined contribution plan as an option; 2 if the state replaced the defined benefit plan with a "combined" defined benefit/defined contribution plan; and 3 if the state replaced the defined benefit plan with a mandatory defined contribution plan.²¹ The exercise included 76 plans; once a state introduced a defined contribution plan, the observation was removed from the sample.²² Complete details are presented in Appendix B; summary results are displayed in Figure 7. The bars show the effect on the probability of introducing a defined contribution plan in a single year. The effects are quite large given that only about 20 percent of sponsors introduced some form of defined contribution plan over the 15-year period.

The results generally — but not universally — confirm the hypotheses put forth above. The funding ratio and the accrual rate do not seem to be important factors for the introduction of a defined contribution plan. On the other hand, as predicted, if the plan includes teachers — that is, it is a highly unionized plan — or if employee contributions are high, the state is less likely to introduce a defined contribution plan.

Two aspects of these results are surprising. First, the fact that states with a large percentage of workers not covered by Social Security had a higher probability of introducing a defined contribution plan is unexpected. The results are clearly driven by events in Colorado, Ohio, and Alaska, three states with a very high proportion of non-covered workers. In Colorado and Ohio, the defined contribution plans are optional and the take-up has been modest. Thus, most of these workers will continue to have the protection against investment risk and the promise of annuity that comes with a defined benefit plan. In Alaska, however, the story is quite different. Despite the fact that nearly three quarters of Alaska's public

FIGURE 7. EFFECT ON THE PROBABILITY OF INTRODUCING A DEFINED CONTRIBUTION PLAN



Note: For the binary variables, teachers covered in plan and Republican control, the bars represent the change in the probability derived from a 0 to 1 change (no teachers in the plan to teachers in the plan, no Republican control to Republican control). For the other variables, the bars represent the change in probability derived from going from the 25th percentile to the 75th percentile in each variable. For each variable, these calculations hold all other variables constant at their means.

Sources: See Appendix B.

employees are not covered by Social Security, all new hires are required to join a defined contribution plan. Therefore, state workers and teachers in Alaska will not have any form of defined benefit protection.

The second interesting aspect of the results is the importance of Republican control.²³ Its impact is larger and more robust than any of the other factors. Having a Republican governor and a Republican legislature increases the probability of introducing some type of defined contribution plan by 6 percentage points.

CONCLUSION

Although the introduction of defined contribution plans by some states has received a lot of press attention, activity to date has been modest. Excluding the eight states that have simply added a defined contribution option, only four have introduced any form of mandatory defined contribution plan. Given the recentness of the changes and the limited amount of compulsion, assets and participants in defined contribution plans are only a tiny fraction of state and local totals.

For any given level of benefits, defined contribution plans cost more than defined benefit plans for state retirement systems. Even so, sometimes debates about introducing a defined contribution plan suggest the state could save money. Other arguments for defined contribution plans have rested more on the ability of people to control their investments and take their accumulations with them when they move from job to job — aspects that might appeal to younger workers. Of course, moving away from defined benefit plans means that individuals must face the risk of poor investment returns, the risk that they might outlive their assets, and the risk that inflation will erode the value of their income in retirement.

The question is why twelve states introduced a defined contribution plan in some form or another. The answer appears to be, in large part, political philosophy. Republicans value the control over investments and portability offered by defined contribution plans and when they have dominated the political scene they have often changed the nature of public pensions.

APPENDICES

APPENDIX A. PRIMARY DEFINED CONTRIBUTION PLANS

TABLE A1. CHARACTERISTICS OF PRIMARY DEFINED CONTRIBUTION PLANS

State	Plan name	Legislative date	Plan type(s)	Total participants	Assets (\$ in millions)
AK	Alaska PERS	2005	Mandatory DC	N/A	N/A
AK	Alaska TRS	2005	Mandatory DC	N/A	N/A
CO	Colorado PERA	2004	Choice: DB, DC	225	0.60
FL	Florida RS	2000	Choice: DB, DC	75,377	2,306
IN	Indiana PERF	1997	Mandatory combined	151,959	2,516
IN	Indiana TRF	1997	Mandatory combined	111,565	3,231
MI	Michigan SERS	1996	Mandatory DC	29,914	2,547
MT	Montana PERS	1999	Choice: DB, DC	1,639	31
ND	North Dakota RS	1999	Choice: DB, DC	291	15
OH	Ohio PERS	2000	Choice: DB, DC or combined	13,363	140
OH	Ohio STRS	2000	Choice: DB, DC or combined	9,631	224
OR	Oregon PERS	2003	Mandatory combined	187,704	1,172
SC	South Carolina RS	2000	Choice: DB, DC	27,622	477
VT	Vermont PERS	1998	Choice: DB, DC	592	36
WA	Washington PERS	1999	Choice: DB, combined	23,009	1,102
WA	Washington SERS	1998	Choice: DB, combined	33,454	860
WA	Washington TRS	1998	Choice: DB, combined	54,631	3,189
Total				720,976	17,845

Source: 2006 Annual Reports of each state system.

APPENDIX B. DATA AND METHODOLOGY

The sample includes annual data for plans for state employees (PERS or SERS) and teachers (TRS) between 1992 and 2006.²⁴ The factors affecting the change from a traditional defined benefit plan are the employee contribution rate, party control of the state legislature and governor, the percentage of public workers not covered by Social Security in the state, the funding ratio of the plan, the annual benefit accrual rate, and whether teachers are included in the plan. Specifically, the employee contribution rate variable is the ratio of the level of employee contributions to the sum of the level of employee contributions and the level of employer contributions. The funding ratio is the actuarial value of assets divided by the actuarial value of liabilities. The annual accrual rate is the benefit earned as a percent of salary per year of service. The teacher's variable is a dummy variable that equals one if teachers are covered by the plan and zero otherwise.

The data used in the regression come from different sources:

- Actuarial funding ratios, employee contribution rates, annual accrual rate, and the presence of teachers in the plan come from PENDAT (Zorn 1992-2000) and the Public Fund Survey (PFS) (National Association of State Retirement Administrators 2001-2006). For Indiana PERF, Vermont PERS and TRS, and Ohio STRS — which have incomplete information from PENDAT and PFS, — the data come from Wisconsin Legislative Council (1992-2000).²⁵
- The percent of public workers not covered by Social Security in a state is taken from Munnell (2000). This percent is assumed to remain constant over time.
- For each year of data, the Republican control variable takes the value of 1 for states with Republican governors in which Republicans also have more than 50 percent of both houses of the legislature. These data come from the Statistical Abstract of the Census Bureau (U.S. Census Bureau 2007).

The regression is an ordered probit. The dependent variable takes values of 0, 1, 2, or 3.²⁶ A value of 0 indicates the plan did not change from a traditional defined benefit plan in a given year. A value of 1 indicates that the plan offered an optional defined contribution plan in that year. A value of 2 designates a change to a combination plan, with both defined benefit and defined contribution elements. Finally, the dependent variable takes on a value of 3 when a plan switched to a primary defined contribution plan only. Data on the date of the change comes from various retirement systems' annual reports and the websites of state legislatures.²⁷

The introduction of a defined contribution plan is coded to the year in which the change was enacted by the legislature. Three plans switched to a defined contribution plan only in this time period (Michigan SERS (1996), Alaska PERS (2005), and Alaska TRS (2005)). Two plans introduced a combination plan (Indiana PERF (1997) and Oregon PERS (2003)). Finally, ten plans added a defined contribution option to their primary plan (Colorado PERA (2004), Florida RS (2000), Montana PERS (1999), North Dakota DCRP (1999), Ohio PERS (2000), Ohio STRS (2000), South Carolina PERS (2000), Vermont PERS (1998), Washington PERS (1999), and Washington TRS (1995)).

The results displayed in the text are the difference in the probability of being in category 0 (no change) for a base value of one of the explanatory variables and a comparison value of that variable. For example, the probability of “no change” for a state without Republican control is 99.4 percent. The same probability, “no change,” with Republican control is 93.9 percent. The difference, 5.5 percent, can be interpreted as the effect of Republican control on the likelihood of changing the nature of the plan from a defined benefit to some type of defined contribution. For continuous variables (employee contribution rate, percent not covered by Social Security, accrual rate, and actuarial funding ratio), the values used to estimate the change in the likelihood are the 25th and the 75th percentiles of these variables. In each of these calculations, all other explanatory variables are held at their means.

ENDNOTES

- 1 48 states provide access to a supplementary defined contribution plan. See Ferrara (2002).
- 2 The District of Columbia also requires its general government employees to join a primary defined contribution plan, but our analysis is limited to states. Other states have considered moving to a primary defined contribution plan. For example, California's governor proposed such a switch in 2004, but this plan generated substantial opposition from public employee unions and the proposal was dropped in 2005. For more details on other attempts to move into defined contribution plans, see AFSCME (2007).
- 3 A combined plan is made up of a defined benefit plan funded by the employer and a defined contribution plan funded by the employee. In every choice state except Washington and Ohio, the options are either a traditional defined benefit plan or an alternative defined contribution plan. Washington offers a choice of a defined benefit plan or a combined plan. Ohio employees can choose from a defined benefit plan, a defined contribution plan, or a combined plan.
- 4 Mandatory combined plans require employees to join a plan with both a defined benefit and defined contribution component. Mandatory defined contribution plans are primary plans that require employees to join. "Choice" plans typically allow employees to pick either a primary defined contribution plan or a primary defined benefit plan. Mandatory defined benefit plans are primary plans that require employees to join.
- 5 For example, from January 1, 1995 to December 31, 1999, the S&P 500 had an average annual return of nearly 30 percent.
- 6 In the private sector, when a new plan is adopted the existing defined benefit plan is generally frozen. Existing employees can retain the benefits earned but are not permitted to accrue any further service credits. In the public sector, when a new plan is adopted, existing employees generally have a legal right to continue to participate in the previous plan and only employees hired after the date the plan is adopted are required to participate in the new plan.
- 7 Authors' calculations from the U.S. Census Bureau (2007), U.S. Board of Governors of the Federal Reserve System (2007), and 2006 Annual Reports of each state system.
- 8 These expenses are weighted by assets; see Investment Company Institute (2007). Index funds generally have considerably lower expense ratios — on the order of 0.10 to 0.20 percent. These funds, however, are not used widely by primary defined contribution plans in the public sector. In the Colorado PERA, Montana PERS-DCRP, Michigan SERS, and Ohio PERS, index funds hold less than 20 percent of the assets.
- 9 Private sector defined benefit plans are non-contributory so the cost to the employer was about eight percent of payrolls. Shifting to a 401(k) reduced the employer's contribution — in the case of a 50 percent match — to about three percent.
- 10 For example, in both Florida and Michigan the defined contribution initiative arose partly from public sector employer concerns over their ability to attract and retain workers (Huntley, 2001; and Rehfeld, 1998).
- 11 While optional plans provide the potential for attracting a broad group of workers, they do come at a cost to the employer. Under a traditional defined benefit plan, short-tenured workers often forfeit pension benefits when they leave, and these forfeitures subsidize higher benefits for career workers. Under optional plans, these short-tenure workers are likely to choose the defined contribution plan, which would end the cross subsidy to long-tenure workers. This adverse selection cost is estimated to be about 1.5 percent of payroll. See Trager, Francis, and SigRist (2001).
- 12 See Munnell et al. (2006).
- 13 Nebraska Public Employees Retirement Systems (2002).

14 See Giertz and Papke (2007).

15 See Munnell and Soto (2007). Another recent study, using a somewhat different sample, found that state pension plans were about 85 percent funded in 2006 (The Pew Center on the States, 2007).

16 For more details on public sector employee tenure and union support of defined benefit plans, see Munnell, Haverstick, and Soto (2007).

17 Proponents might also argue — albeit incorrectly — that switching to a defined contribution plan could get the state out of a serious underfunding problem.

18 See Fore (2001).

19 See Fore (2001).

20 See Ferlauto (2002); and American Federation of Teachers (2007).

21 The ordered probit specification assumes that there is an inherent order in the outcomes depending on the degree of compulsion — optional involves less compulsion than combined, and combined less compulsion than mandatory. See Appendix B for the detailed ordered probit results. An alternative formulation ignores the ranking and assumes each type of defined contribution plan is an option without regard to the degree of compulsion. Nevertheless, this formulation does combine changes that require mandatory participation in the defined contribution plan with those where participation is optional. Running two separate binary probit equations, however, in which the first equation estimates the effects on the probability of introducing a mandatory defined contribution plan and the second equation estimates the effects on the probability of introducing an optional defined contribution plan, produces equivalent results to the ordered probit.

22 Prior to 2003, Nebraska was excluded from the analysis because it has always had a defined contribution plan and, therefore, was not in a position to switch. Recently, Nebraska switched to a cash balance plan. The West Virginia TRS plan was excluded from the analysis since it was switched to a defined contribution plan in 1991, which is outside the period of analysis. (It was later switched back to a defined benefit plan in 2005.)

23 The importance of political philosophy in the move to defined contribution plans in the public sector was first suggested by Wiles (2006).

24 West Virginia TRS plan was excluded since it was a defined contribution plan from 1992-2005. Nebraska PERS was a defined contribution plan from 1964-2003 and was also excluded from the sample.

25 Data before 2000 are available for even years only. Data for odd years are imputed using the midpoint between the two adjacent even years of data for actuarial funding ratios and employee contribution rates. Only plans with valid data for the previous and subsequent years had values imputed. These data comprise an unbalanced panel.

26 The standard errors are adjusted for the repeated observations for each state.

27 For quick access to state annual reports, visit: <http://www.npers.ne.gov/public/aboutus/otherRetirement.jsp>.

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