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DEFINED CONTRIBUTION PLANS IN THE PUBLIC SECTOR: AN UPDATE

*By Alicia H. Munnell, Jean-Pierre Aubry, and Mark Cafarelli**

Introduction

The financial crisis and its aftermath generated two types of responses from sponsors of state and local government pensions. The first was to cut back on existing defined benefit plan commitments by raising employee contributions, reducing benefits for new employees and, in some cases, suspending the cost-of-living adjustments for existing retirees. The second response was to initiate proposals to shift some or all of the pension system from a defined benefit to a defined contribution plan. This *brief* describes this flurry of defined contribution activity, identifies the factors that led to the changes occurring in the states where they did, and presents data on participation and assets to put the flurry into perspective. The data show that, while the introduction of defined contribution plans by some states has received considerable attention, activity to date has been modest.

Defined Contribution Activity

Most state and local workers are covered by a traditional defined benefit plan. In addition, 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 changes at the primary plan level. For discussion purposes, it is useful to look at the pre-crisis and post-crisis periods separately.

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Before the 2008 Financial Crisis

Before the financial crisis, a number of states had introduced a defined contribution plan to their structure. Most of these plans took the form of an optional defined contribution plan. That is, the sponsor retained its defined benefit plan and simply offered employees the alternative of participating in a defined contribution plan instead. Only two states, Michigan and Alaska, introduced plans that require all new hires to participate solely in a defined contribution plan.[2] The Alaska reform applied to both general state and local workers and teachers, while the Michigan reform was limited to general state workers. Three states, California, Indiana, and Oregon, adopted hybrid plans, where employees are required to participate in both a defined benefit and a defined contribution plan.[3] The timeline of the introduction of these defined contribution plans is interesting; much of the activity occurred in the wake of the fantastic performance of the stock market during the 1990s (see Figure 1).

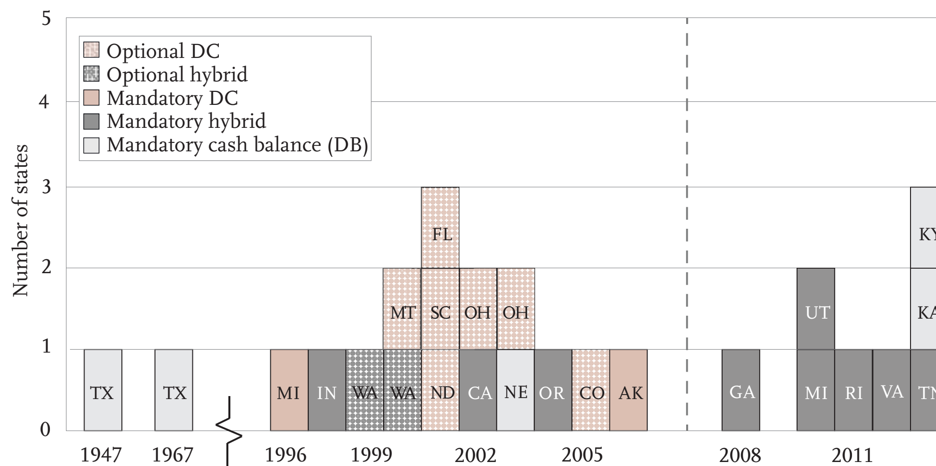
Since the Financial Crisis

In the wake of the financial crisis, sponsors have once again shown interest in defined contribution plans. This second wave of initiatives is quite different than the pre-crisis changes. First, all the new plans are mandatory, as opposed to mainly voluntary in the pre-crisis period. Second, being mandatory, they apply only to new employees. Third, none of the sponsors has followed the earlier Alaska-Michigan model of forcing employees to rely solely on a defined contribution plan where the employee bears all the risks. Rather, the post-crisis plans consist of either a hybrid plan or a cash balance plan, which is a defined benefit plan that maintains notional individual accounts but provides some guaranteed base return.

Hybrid Plans. Since the financial crisis, six states have replaced their traditional defined benefit plan with a mandatory hybrid plan. The following provides a thumb-nail sketch of these new initiatives.

Georgia. According to system administrators, the shift was driven mainly by the preference of young workers, who make up over 60 percent of the state's workforce, for wages over benefits.[5] In response, the state raised wages and introduced a hybrid pension plan with a smaller defined benefit plan and a 401(k) component for young mobile workers.[6] New hires are automatically enrolled in the 401(k) plan at 1 percent of salary with contributions up to 5 percent eligible for an employer match. The match is 100 percent of the automatic contribution and 50 percent of optional contributions, for a maximum match of 3 percent of salary. The defined benefit plan will pay 1 percent for each year of service on the annual average of the highest 24 months of earnings.[7] Members contribute 1.25 percent of salary to the defined benefit plan, and the state contributes the rest.

Figure 1. Introduction of State Defined Contribution Plans, by Year, 1947-2013[4]



Sources: Actuarial reports; state websites; National Association of State Retirement Administrators (2013); and Munnell (2012).

Michigan. Press reports suggest that containing future employer costs (including required contributions for retiree health insurance) was a major motivation for the new plan.[8] Despite the fact that Michigan general state employees have been enrolled in a defined contribution plan, the state decided to adopt a hybrid for public school employees. New employees automatically contribute 2 percent of salary to the defined contribution plan, with optional contributions up to the IRS limit. The sponsor matches 50 percent of the employee's first 2 percent of contributions.[9] The defined benefit plan pays 1.5 percent for each year of service on the annual average of the highest 60 months of earnings.[10] Employees will contribute 6.4 percent of salary to the defined benefit plan.

Rhode Island. The impetus for reform was the prospect of the system running out of money within ten years. Suspending the cost-of-living-adjustment (COLA) until the trust fund was 80 percent funded provided immediate relief. Current employees saw their defined benefit plan replaced by a hybrid plan and their expected worklife lengthened as the retirement age gradually rises to mirror that of Social Security. The reforms have been challenged in court. Through mediation, the parties agreed in February 2014 to adopt the reforms with only modest changes; but, in April 2014, the mediation agreement was rejected by police union members so the parties are headed back to court.

Utah. The motivation in this case was the state's desire to reduce its risk exposure. (The Utah plans are fairly well funded.) New employees have the option of participating in either a defined contribution plan or a hybrid. In the case of a defined contribution plan, the employer will automatically contribute 10 percent of an employee's compensation for most public employees and 12 percent for public safety and firefighter members.[11] Under the hybrid plan, the employer will pay up to 10 percent toward the defined benefit component; employees will contribute any additional amount to make the required contribution.[12] When the cost of the defined benefit plan is less than 10 percent, the difference is deposited into the employee's defined contribution account.

Tennessee. This hybrid plan is mandatory for all public employees, except local government workers. The defined benefit portion will provide 1 percent of final salary, financed by an employee contribution of 5 percent and a target employer contribution of 4 percent. The defined benefit portion includes a COLA based on the Consumer Price Index, capped at 3 percent. In the defined contribution portion, the employee is automatically enrolled at 2 percent while the employer contributes 5 percent.

Virginia. Under the hybrid plan, the defined benefit component will provide 1 percent of final salary (average of the last 60 months) for each year of service, financed by an employee contribution of 4 percent and an actuarially determined employer contribution. The defined benefit plan includes a COLA, capped at 3 percent. On the defined contribution side, the employee is required to contribute 1 percent, but the employer will match contributions up to 5 percent – 100 percent on the first 2 percent and 50 percent on the next 3 percent.

Cash Balance Plans. Three states have recently passed legislation to introduce cash balance plans. Cash balance plans are defined benefit plans where each member has a notional account to which the employer and, in the public sector, the employee each make contributions, and the employer credits a return annually. These plans differ in two important ways from traditional defined benefit plans. First, they enhance the likelihood of making required contributions, thereby preventing the future buildup of large unfunded liabilities. Second, they allocate benefits more evenly between short- and long-term employees than the traditional back-loaded defined benefit plans. Four public sector systems – Nebraska (for state and county workers), the Texas Municipal Retirement System, the Texas County and District Retirement System, and the California State Teachers' Retirement System for part-time instructors at community colleges – have had cash balance plans for some time. Kansas, Kentucky, and Louisiana have just recently introduced cash balance plans. The Louisiana plan was ruled unconstitutional, so the discussion focuses on Kansas and Kentucky.

Kansas. The employee contributes 6 percent and the employer contributes 3-6 percent (depending on the employee's years of service). The guaranteed interest credit is 5.25 percent with possible additional dividends if investment returns warrant. At retirement, all balances will be annuitized, except that members may withdraw up to 30 percent of their balances in a lump sum.

Kentucky. The employee contributes 5 percent and the employer contributes 4 percent. The guaranteed interest credit is 4 percent plus 75 percent of any net investment return in excess of 4 percent. At retirement, members may choose either annuity payments or a lump-sum payment of the accumulated account balance.

Figure 2 shows *where* the changes have occurred by type of plan. With a few exceptions, the activity has occurred in states with smaller populations. California is clearly not a small state, but it has since withdrawn from the defined contribution business.[13] It is one thing to know where change has occurred; the other question is *why*?

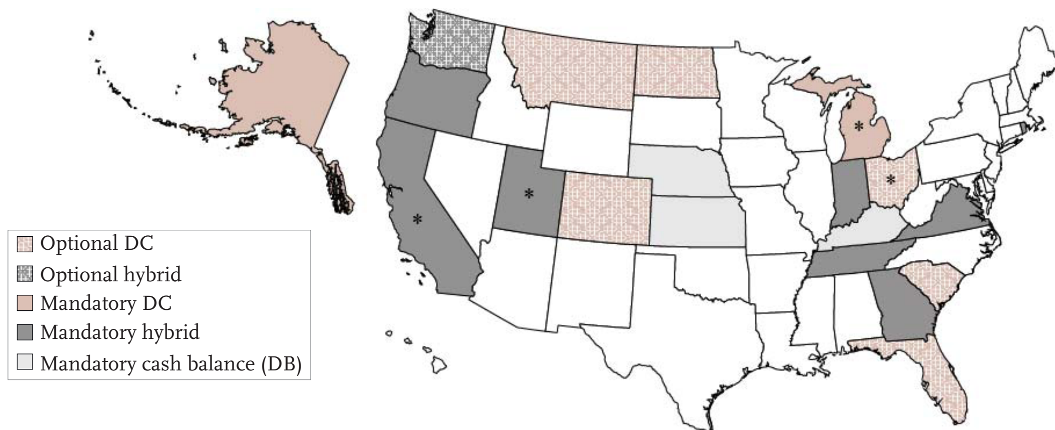
Why Did Some States Introduce Defined Contribution Plans?

The motivation for introducing a defined contribution type plan seems to differ before and after the financial crisis. Before 2008, the motivation appears to have been offering employees an opportunity to manage their own money and participate directly in a rapidly rising stock market. After the financial crisis, the motivation appears to be more defensive – to avoid the high costs associated with large unfunded liabilities; to unload some of the investment and mortality risk associated with traditional defined benefit plans; and to have a less back-loaded benefit structure to increase the amount that short-term employees can take with them when they leave.

We undertook an empirical analysis in two time periods – before the financial crisis and after the financial crisis – to test the extent to which the motivating factors were related to the probability that a plan sponsor would introduce a defined contribution component, including the introduction of a cash balance plan. The analysis included data on each state-administered plan from 1992 through 2013. The dependent variable was set equal to zero if no action was taken and 1 if the state introduced some form of defined contribution plan. The plan was removed from the sample once an action was taken. The independent variables included:

- Average benefits/average salary: This proxy for the costliness of the defined benefit plan would be expected to encourage a shift to a defined contribution plan.
- Unfunded liability/payroll: Plans with large unfunded liabilities relative to payroll are more susceptible to risk and therefore would be more likely to adopt a defined contribution approach to unload some of their investment and mortality risk.
- Teachers in plan: Teachers' representatives are generally more interested in benefits for career employees than for those with short tenure. Thus, teacher plans or plans with a significant number of teachers would be less likely to introduce a defined contribution plan in an effort to reward short-tenure workers.

Figure 2. Location of Defined Contribution Initiatives[14]



Sources: Actuarial reports; state websites; National Association of State Retirement Administrators (2013); and Munnell (2012).

- Republican control: Republicans are more likely to support 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 would be consistent with their political philosophy.
- Social Security coverage: Between 25 and 30 percent of state and local employees are not covered by Social Security. The hypothesis is that states where workers do not have this basic protection would be less likely to introduce a defined contribution plan, where employees would bear all the risks associated with retirement planning.

The results are shown in Figure 3 (with more details in Appendix A). 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 20 percent of sponsors introduced some form of defined contribution plan before the financial crisis, and only 15 percent did so after the crisis.

Before the financial crisis, the probability of introducing a defined contribution plan appears to be positively affected only by political philosophy; neither the cost nor risk factors play a role. After the crisis, political philosophy is less important, while cost and risk factors play a significant role. Both before and after, the presence of teachers is associated with a lower probability of shifting away from a traditional defined benefit plan.

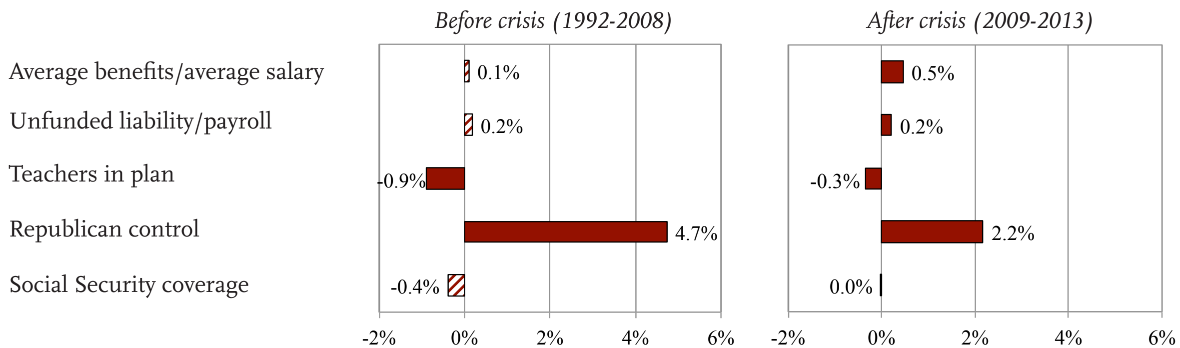
The fact that Social Security coverage did not have any effect on the outcome in either time period is surprising. The results are clearly driven by events in Colorado, Ohio, and Alaska, three states with a very high proportion of non-covered workers. In Colorado and Ohio, the defined contribution plans 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 an 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 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 hired since July 2006 do not have any form of defined benefit protection.

Current Level of 'DC' Activity

While the number of initiatives and the map make it look like a lot is happening on the defined contribution front, the amount of money in these plans is very small (see Figure 4 on the next page and Appendix B). Again the focus here is on primary plans; the amount in supplementary 457 plans is provided as a benchmark.

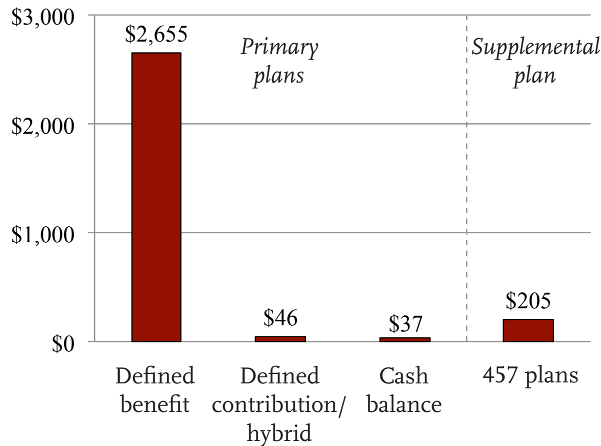
The small amount of money is the result of a number of factors. First, at a slight risk of overstatement, the introduction of an optional defined contribution plan has almost no effect. Virtually no one puts their money in the plan. Florida is a slight exception in that it has $7 billion, mainly because participants are allowed one opportunity to switch between the defined benefit and defined contribution plans after their initial choice. Second, only two states have a mandatory defined contribution plan: Alaska

Figure 3. Impact on the Probability of Introducing a Defined Contribution Plan



Note: Changes are one standard deviation for continuous variables and 0/1 for dichotomous variables. The striped bars indicate that the coefficients are not statistically significant. The solid bars indicate statistical significance at least at the 10-percent level.
Source: Authors' calculations.

Figure 4. Assets in State and Local Pension Plans, in Billions of Dollars, 2012

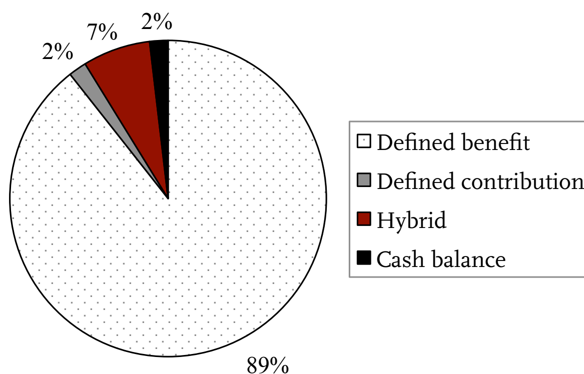


Sources: Actuarial and financial reports; and *Public Plans Database* (2012).

and Michigan. Third, the mandatory hybrid plans ultimately will have an impact on asset allocation between defined benefit and defined contribution, but they are too new for the effect to be visible. And the recent trend is toward cash balance plans, which are technically defined benefit plans.

In terms of participants, the numbers look somewhat more substantial even though all the mandatory provisions apply only to new employees. About 11 percent of public sector workers are currently covered by something other than a traditional defined benefit plan (see Figure 5).

Figure 5. Distribution of State and Local Participants by Plan Type, 2012



Sources: Actuarial and financial reports; and *Public Plans Database* (2012).

An interesting question is what the public pension landscape will look like in 30 years. Today, new employees are a tiny fraction of the workforce. In the future, they will constitute the entire workforce. Our rough estimates, *based on the changes made to date*, are that defined contribution participants will account for 19 percent of the public sector workforce in 2042 and, at that time, defined contribution assets will account for 10 percent of total assets (see Table 1). The discrepancy is due to two factors. First, even in 2042, a sizable share of the assets belongs to retirees who were covered by the old defined benefit plan. Second, and somewhat less important, is that most of the mandatory changes have been to hybrid plans where roughly half the money goes to a defined benefit plan and half to a defined contribution plan.

Table 1. Projected Distribution of State and Local Employees and Assets by Plan Type, 2042

Plan type	Employees	Pension assets
Defined benefit	81%	90 %
Defined contribution	2	1
Hybrid	13	4
Cash balance	4	5
Total	100	100

Source: Authors' calculations.

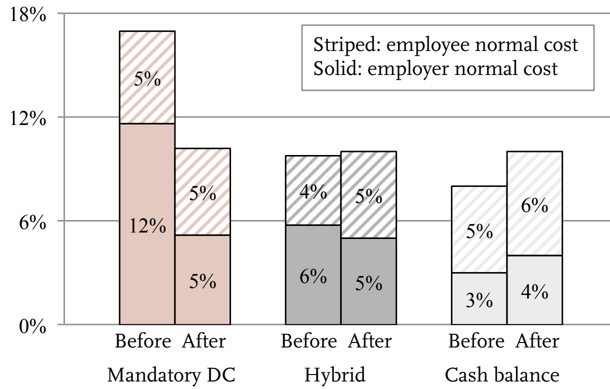
The Impact of the Shift to DCs on Benefits

The remaining question is what happens to benefit levels generally as plan sponsors move away from pure defined benefit plans. Critics argue that sponsors are not only changing the form of the benefit, but also the level.

One measure of the benefit is the normal cost – that is, the amount that employers must put aside each year to cover the cost of accruing benefits. On that front – with the exception of the mandatory defined contribution plans in Alaska and Michigan – plan sponsors appear to be maintaining their previous level of contributions (see Figure 6 on the next page).

The initial contribution, however, does not tell the whole story. Under the traditional defined benefit plan, participants are promised a return of about 8 percent. Under any defined contribution arrangement, workers will receive whatever returns the market offers, which could well be less than 8 percent. Under the cash balance plans introduced

Figure 6. Normal Cost for Mandatory Plans Before and After Legislative Action



Sources: Authors' calculations based on actuarial and financial reports; National Association of State Retirement Administrators (2013); and Munnell (2012).

in Kansas and Kentucky, participants are guaranteed 5.25 and 4 percent, respectively, with the potential of some upside. So benefits have been reduced with the introduction of defined contribution arrangements.

Conclusion

Although the introduction of defined contribution plans by some states has received a lot of press attention, activity to date has been modest. Moreover, most of the recent efforts have been a move to either hybrid plans, with a mandatory defined contribution and defined benefit component, or to cash balance plans, where participants are guaranteed a return of 4 or 5 percent.

Sponsors' shifts from complete reliance on traditional defined benefit plans appear to be driven by a desire to avoid future unfunded liabilities, to reduce investment and mortality risk, and to provide some benefits to short-tenure 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 – on at least a portion of their retirement savings in hybrid plans. Participants in cash balance plans do receive a guaranteed return but, among the plans adopted to date, it is less than the typical 8-percent guarantee in traditional defined benefit plans. But if some defined contribution component or cash balance arrangement enhances the likelihood of responsible funding, public sector employees may enjoy some increased security.

Endnotes

1 Forty-eight states provide access to a supplementary defined contribution plan (Ferrara 2002).

2 The District of Columbia also requires its general government employees to join a primary defined contribution plan, but the analysis here 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 American Federation of State, County and Municipal Employees (2007).

3 In addition, Washington state introduced a hybrid option for two of its plans.

4 Utah, which offers employees a choice between a hybrid and a defined contribution plan, is classified as mandatory hybrid, because employees are required to have some defined contribution plan. Ohio PERS and STRS, which offer a choice of defined contribution, hybrid, or defined benefit, are classified as optional defined contribution since employees are not required to have any defined contribution plan.

5 Teacher Retirement System of Texas (2012).

6 In the public sector, the only defined contribution plans that are technically 401(k)s are grandfathered plans that were established by May 6, 1986; Georgia's plan was originally created before 1986 as an optional supplement to its primary defined benefit plan. See U.S. Government Accountability Office (2012).

7 The Board of Trustees can increase the benefit factor in the future to up to 2 percent if funds are available.

8 *GovMonitor* (2010); and Michigan Association of School Boards (2010).

9 Michigan House Fiscal Agency (2009).

10 While the accrual rate is the same as it was under the two existing defined benefit plans for school employees, the age and service requirements for this plan have been increased and the COLA eliminated.

11 Liljenquist (2010).

12 Employers are also required to pay 5 percent of payroll to the Utah Retirement System to amortize legacy unfunded pension liabilities.

13 CalSTRS defined benefit plan included a mandatory cash balance component from 2001-2010; this component is now discontinued and the contributions instead go into the defined benefit plan. California still has a small (400-person) optional cash balance plan for part-time employees at public schools.

14 Michigan SERS is a mandatory defined contribution plan, while Michigan MPSERS is a mandatory hybrid plan. CalSTRS' defined benefit plan included a mandatory cash balance component from 2001-2010, which was discontinued in 2011. Utah, which offers employees a choice between a hybrid and a defined contribution plan, is classified as mandatory hybrid, because employees are required to have some defined contribution plan. Ohio PERS and STRS, which offer a choice of defined contribution, hybrid, or defined benefit, are classified as optional defined contribution since employees are not required to have any defined contribution plan.

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APPENDICES

Appendix A

Table A1. Summary Statistics for Regression on Probability of Introducing a Defined Contribution Plan, Pre-Crisis

Variables	Number of observations	Mean	Standard deviation	Minimum	Maximum
Average benefits/average salary	1,024	0.45	0.17	0	1
Unfunded liability/payroll	1,024	50.54	48.14	0	289
Teachers in plan	1,024	0.53	0.50	0	1
Republican control	1,024	0.19	0.39	0	1
Social Security coverage	1,024	0.77	0.42	0	1

Source: Authors' calculations.

Table A2. Summary Statistics for Regression on Probability of Introducing a Defined Contribution Plan, Post-Crisis

Variables	Number of observations	Mean	Standard deviation	Minimum	Maximum
Average benefits/average salary	1,177	0.45	0.16	0	1
Unfunded liability/payroll	1,177	61.94	52.51	0	289
Teachers in plan	1,177	0.51	0.50	0	1
Republican control	1,177	0.20	0.40	0	1
Social Security coverage	1,177	0.80	0.40	0	1

Source: Authors' calculations.

Table A3. Regression Results for Probability of Introducing a Defined Contribution Plan

Variables	Pre-crisis	Post-crisis
Average benefits/average salary	0.006	0.010 *
	(0.012)	(0.007)
Unfunded liability/payroll	0.000	0.000 **
	(0.000)	(0.000)
Teachers in plan	-0.009 **	-0.003 **
	(0.005)	(0.003)
Republican control	0.047 *	0.022 ***
	(0.017)	(0.011)
Social Security coverage	-0.004	0.000
	(0.006)	(0.002)
Pseudo R^2	0.197	0.222
Number of observations	1,024	1,177

Note: Robust standard errors for state-level clustering are in parentheses. The coefficients are significant at the 10-percent level (*), 5-percent level (**), or 1-percent level (***).
Source: Authors' calculations.

Appendix B

Table B1. Characteristics of Primary Defined Contribution Plans

Plan name	Participants						Assets (millions)				
	Year enacted	2007	2009	2010	2011	2012	2007	2009	2010	2011	2012
Optional defined contribution plans											
Colorado PERA – PERAChoice	2004	489	3,039	3,479	4,029	4,362	$3	$37	$53	$64	$83
Florida FRS Investment Fund	2000	98,070	121,522	127,940	137,900	148,837	3,687	4,075	5,050	6,738	7,100
Montana PERS – DCRP	1999	1,563	1,949	2,019	2,026	2,035	41	44	58	77	85
North Dakota PERS – DCRP	2000	301	300	293	287	283	18	14	17	21	23
Ohio PERS – Member-Directed Plan	2002	8,579	9,824	11,010	12,215	12,815	124	201	279	317	410
Ohio STRS – Member-Directed & Combined Plans	2001	4,268	4,500	4,503	4,614	4,671	283	297	384	519	568
South Carolina SCRS – State ORP	2000	16,081	19,902	19,574	19,681	20,021	502	561	696	830	965
Utah – Tier II Defined Contribution Plan	2010	0	0	0	0	524	0	0	0	0	19
Optional hybrid plans											
Ohio PERS – Combined Plan	2000	6,905	7,354	7,627	8,024	8,418	157	223	301	334	420
Washington PERS – Plan 3	1999	25,290	30,367	31,126	32,175	32,656	1,348	1,188	1,374	1,689	1,724
Washington SERS – Plan 3	1998	36,564	38,138	38,585	38,996	39,541	1,052	918	1,053	1,269	1,278
Washington TRS – Plan 3	1988	58,349	58,952	60,146	60,309	61,312	3,971	3,419	4,025	5,032	5,171
Mandatory defined contribution plans											
Alaska PERS – DCR Plan	2005	2,862	7,516	9,716	11,736	13,643	9	56	104	184	246
Alaska TRS – DCR Plan	2005	646	1,997	2,663	3,240	3,762	6	27	48	84	110
Michigan SERS	1996	24,043	25,540	266,335[a]	27,155[a]	28,000[a]	2,547	2,750	1,481	1,909	2,461[a]
Mandatory hybrid plans											
California CalSTRS – DB Supplement Program	2001	455,453	458,243	440,824	417,262	403,117	3,951	5,636	6,412	8,054	8,042
Georgia GSEPS	2008	0	2,105	6,835	11,093	15,246	0	310	361	440	450
Indiana PERF – ASA	1997	138,863	147,792	149,877	147,933	145,519	2,694	2,669	2,780	2,805	2,749
Indiana TRF – ASA	1997	39,307	45,046	46,433	46,633	47,885	2,715	2,920	3,423	3,665	3,936
Michigan MPSERS	2010	0	0	1,800	18,803	24,340	0	0	64	79	308

Plan name		Participants					Assets (millions)				
	Year enacted	2007	2009	2010	2011	2012	2007	2009	2010	2011	2012
Oregon PERS – IAP	2003	43,541	58,097	69,227	80,753	76,002	1,877	2,109	2,928	4,037	4,392
Rhode Island ERSRI	2011	0	0	0	22,504	25,723[a]	0	0	0	7,489	7,284
Tennessee – TCRS State and Teachers	2013[b]										
Utah – Tier II Contributory Hybrid	2010	0	0	0	4,429	9,949	0	0	0	3	18
Virginia VRS Hybrid	2012[b]										
Mandatory cash balance											
Kansas KPERS	2013[c]										
Kentucky RS	2013[b]										
Louisiana SERS	2013	Ruled unconstitutional									
Louisiana TRS	2013	Ruled unconstitutional									
Nebraska County ERS	2002	4,156	5,446	5,645	5,639	5,796	$116	$130	$166	$200	$209
Nebraska State ERS	2002	9,051	11,323	11,739	11,200	11,263	421	470	594	689	702
Texas Municipal TMRS	1947	98,440	102,419	101,240	101,151	100,517[a]	14,203	16,306	17,992	18,571	
Texas County & District TCDRS	1967	116,858	123,446	122,889	121,919	121,963	16,910	15,556	17,730	17,626	19,885

[a] Authors' estimates.
[b] Effective for new hires Jan. 1, 2014.
[c] Effective for new hires Jan. 1, 2015.
Sources: *Public Plans Database* (2007 and 2009); and various financial and actuarial reports.

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