



2021 UPDATE: PUBLIC PLAN FUNDING IMPROVES AS WORKFORCE DECLINES

By Jean-Pierre Aubry and Kevin Wandrei*

INTRODUCTION

When our last update on state and local pension funding was released in May 2020, public finance experts were projecting declines in government tax revenue due to the economic fallout from the pandemic, and investment experts were cautious about the stock market after the March crash. But, since then, the stock market has recovered mightily from the March 2020 lows and reports show better-than-expected revenue for state and local governments.¹ Yet, one other disruption from the pandemic – a dramatic reduction in the size of the state and local workforce – may have negatively impacted public pension finances.

This update documents the reported funded status of plans as of Fiscal Year (FY) 2020 and uses what we know about 2021 to estimate the current funded status of plans. The discussion is organized as follows. The first section estimates that the aggregate ratio of assets to liabilities for public plans rose from 72.8 percent in

2020 to 74.7 percent in 2021. At the same time, the average actuarially determined contribution is estimated to rise from 21.3 percent to 22.0 percent of payroll. The second section documents the COVID-related decline in state and local employment and investigates its impact on plan funded levels and contribution rates. The final section concludes that the cuts to state and local employment in response to COVID have had only a minor impact on funded ratios and required contribution amounts, but they do explain the increase in the required contribution *rates*, which are now expressed as a percentage of lower payrolls.

THE FUNDED STATUS OF PUBLIC PLANS

As of May 2021, just under half of the 200 major state and local government pension plans in the *Public Plans Database* (PPD) reported their 2020 funded

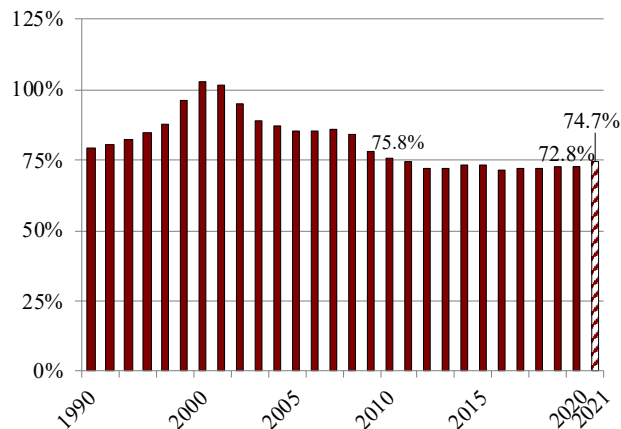
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levels.² None had reported 2021 levels. To describe the current status of public plans, this analysis makes plan-by-plan projections using data provided in each plan's most recently released reports.³ Based on these projections, the aggregate actuarial funded ratio is estimated to have increased by 2 percentage points from 2020 to 2021, from 72.8 to 74.7 percent (see Figure 1).⁴ Despite this projected improvement, the 2021 funded ratio is still about 1 percentage point below levels reported more than a decade ago in 2010.⁵

FIGURE 1. AGGREGATE FUNDED RATIO FOR STATE AND LOCAL PENSION PLANS, FY 1990-2021

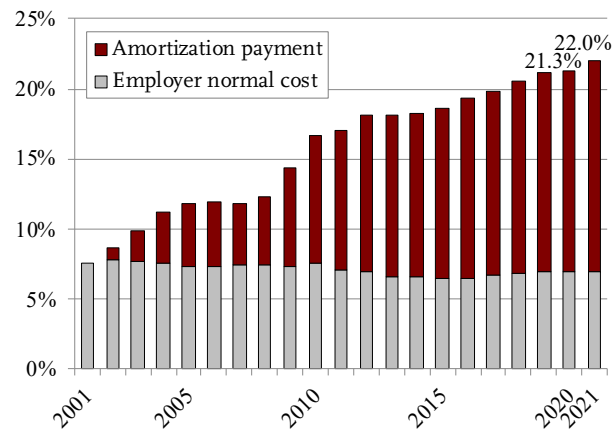


Sources: Authors' estimates based on various plan financial reports; and *Public Plans Database* (PPD) (2001-2020).

The actuarially determined employer contribution rate – the rate required to keep the plan on a steady path toward full funding – is estimated to rise slightly, from 21.3 to 22.0 percent of payroll (see Figure 2).⁶ Virtually all of the increase in the 2021 contribution rate stems from an increase in the amortization rate – the portion of the required contribution dedicated to paying down unfunded liabilities – from 14.4 to 15.0 percent of payroll.⁷

Many pension researchers (and some practitioners) have questioned the adequacy of actuarially determined contributions as they are commonly calculated – highlighting the use of overly optimistic investment return assumptions and relatively lax methods for amortizing the unfunded liability by backloading payments. If investment return assumptions more closely reflected actual performance since

FIGURE 2. REQUIRED ANNUAL CONTRIBUTION AS A PERCENTAGE OF PAYROLLS, FY 2000-2021



Sources: Authors' estimates based on various plan financial reports; and PPD (2001-2020).

2001, and plans adopted more stringent approaches to amortizing their unfunded liabilities (by using level dollar instead of level percent of pay), the average actuarial contribution in 2021 would rise from 22.0 to 39.1 percent of payroll.⁸

HOW DID THE RECENT DECLINE IN EMPLOYMENT IMPACT PUBLIC PLANS?

State and local governments cut nearly 1.5 million workers from March to August 2020 – representing roughly a 0.5-percentage-point drop in state and local government employment as a share of the total U.S. population (see Figure 3 on the next page).⁹ This drop may seem small in response to a major event like COVID, but it is similar to the decline experienced in the wake of the 2008-2009 financial crisis, which occurred over a much longer period.¹⁰

At first blush, one might presume that lower employment would improve the finances of troubled pension systems – fewer employees, fewer pensions. The decline in payroll, however, can adversely impact plan finances in two ways. The first impact is real, in that it can lead to less funding and higher subsequent required pension contributions. The second is more cosmetic in that reduced employment increases the required contribution *rates* by lowering the payroll base.

FIGURE 3. STATE AND LOCAL EMPLOYEES AS A PERCENTAGE OF TOTAL U.S. POPULATION, 2001-2021



Source: Authors' calculations using data from the U.S. Bureau of Labor Statistics (BLS) (2001-2021) accessed through the Federal Reserve Bank of St. Louis.

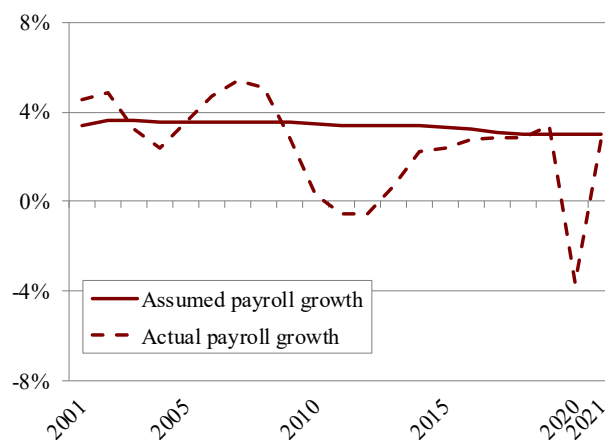
IMPACT ON FUNDING

To understand why lower employment might negatively impact the funding of plans, it helps to first walk through the process by which most public plans set and pay their required contributions. For government budgeting purposes, pension contributions must be calculated before they will be made, from as early as a year to even two or three years in advance. The amortization payment – which currently makes up two-thirds of the average pension contribution for governments – is a fixed-dollar amount required to reduce unfunded liabilities. But, for budgeting purposes, the required amortization amount is expressed as a percentage of total *expected* payrolls because a salary rate is more convenient for billing across various government departments. When the time comes for these departments to pay their annual pension contributions, the amortization rate – which was calculated based on total *expected* payroll – is applied to employees' *actual* salaries in the contribution year.

Given the process just described, contributing the intended amortization payment each year requires that actual payrolls meet expectations. Annual payroll growth has regularly oscillated between periods of lower- and higher-than-expected rates of growth, but the dramatic payroll decline due to COVID brings this issue into stark relief (see Figure 4).¹¹ Perhaps surprisingly, the dramatic difference between actual and expected payroll growth during COVID resulted in

only a 0.3-percentage-point difference in the aggregate 2021 funded ratio (an estimated \$16 billion less in amortization payments divided by an estimated \$5.8 trillion in 2021 liabilities).¹² The modest impact can be attributed to the fact that annual amortization payments are intended to only incrementally improve the funded status, so even a dramatic one-time shortfall in the annual payment will have only a small impact on the funded ratio.¹³

FIGURE 4. COMPARISON OF ACTUAL AND EXPECTED STATE AND LOCAL PAYROLL GROWTH, FY 2001-2021



Note: Payroll for 2020 is imputed using month-to-month rates of change from the BLS.

Sources: Various actuarial valuations and financial reports; PPD (2001-2020); and BLS (2001-2021) accessed through the Federal Reserve Bank of St. Louis.

IMPACT ON REQUIRED CONTRIBUTIONS

While the first impact of lower payrolls results in a true increase in plan costs, the second results in a purely cosmetic increase to the contribution *rate*. Overall, the decline in payroll resulted in 2021 contribution rates that were 2.2-percentage-points higher than they would have been if payrolls had grown as expected. Specifically, the 2021 amortization rate would have been 12.8 percent rather than 15.0 percent, and the total employer contribution rate would have been 19.8 percent rather than 22.0 percent. Of the 2.2-percentage-point increase, higher amortization payments accounted for only 0.1 percentage points, while the decline in the payroll base over which the higher amortization payments are expressed accounted for 2.1 percentage points.¹⁴

MITIGATING THE IMPACT ON PENSION FINANCES

A few governments have taken steps to limit the – admittedly small – unintended underfunding that comes with periods of lower-than-expected payroll growth by charging the calculated amortization payment as a fixed-dollar amount rather than converting it to a contribution rate. For example, the Houston Municipal Employees Retirement System currently charges amortization payments as fixed-dollar amounts to each city department. And, in Kentucky, legislation passed in March of 2021 will change the Kentucky Public Pensions Authority’s billing to a fixed-dollar payment. Under a fixed-dollar payment method, the intended amortization amounts would be contributed each year regardless of declines in payroll. Such changes would protect employer contributions to these systems from unintentional reductions if state and local government employment declines in the future. And, if amortization payments are expressed as dollar amounts, it would reduce the appearance of rising contribution rates due solely to a decline in payrolls.¹⁵

CONCLUSION

At the end of FY 2020, most pension experts had tempered their expectations for the near-term prospects of public pension finances based on the dire forecasts made by public finance experts early in the pandemic. However, strong investment performance since the market nadir in March 2020 has resulted in better-than-expected pension returns. As a result, the ratio of assets to liabilities for public plans is projected to improve from 72.8 percent in 2020 to 74.7 percent in 2021. At the same time, the average actuarially determined contribution is estimated to rise by about 1 percentage point from 21.3 to 22.0 percent of payroll.

The decline in payrolls during COVID caused funded ratios and required contribution amounts to be only slightly worse than they would have been if payrolls had grown as expected. That said, the required contribution *rate* increased more noticeably due to the lower payroll base over which the slightly higher required contributions are now expressed. Interestingly, some plan sponsors have shifted to charging amortization payments as a fixed-dollar amount rather than a percentage of salary. Doing so would remove the potential for unintended underfunding going forward and, if amortization payments are reported as a dollar amount, reduce the appearance of rising contribution rates whenever there is a decline in employment.

ENDNOTES

- 1 Leachman and McNichol (2020) report that the decline in state revenues for 2020 was significantly less than originally expected. Sheiner (2020) finds that, in aggregate, federal aid to date exceeds estimated revenue losses projected for the next few years.
- 2 The [PPD](#) contains financial data from 2001 to the present (based on the latest available data) for 200 of the largest state and local plans in the United States. This sample covers over 95 percent of state and local pension members and assets.
- 3 Investment performance is based on each plan's asset allocation and the performance of selected indices – Russell 3000 for equities; S&P Aggregate Bond Index for fixed income; S&P 3-month US Treasury Index for cash; LPX Group Composite Listed Private Equity Index for private equity; HFRI Fund of Funds Composite for hedge funds; Bloomberg Commodity Index for commodities; and the NCREIF ODCE Index for real estate. For cash flows, benefits grow based on each plan's annualized benefit growth from 2014-2019, while the contributions for each plan are assumed to grow at the same rate as aggregate state and local payrolls, which are based on the changes in total employment and average wages reported by the U.S. Bureau of Labor Statistics from March 2020 to April 2021 (and no growth from April to the end of FY 2021). The change in market assets is estimated using the simplified formula: $\text{Asset}(t+1) = (\text{Asset}(t) * \text{investment return}) + (1/2 * \text{cash flows} * \text{investment return}) + (1/2 * \text{cash flows})$. Actuarial assets are calculated using the smoothing methods reported in each plan's most recent actuarial valuation. Liability growth is based on interest on the prior year's liability plus normal cost net of benefit payments.
- 4 In 2021, the average actuarially expected investment return was about 7.1 percent, while the average return on assets for the fiscal year ending in June is estimated to be about 25 percent. Since 2010, the annualized return on market assets has been about 9.2 percent for public plans but, due to actuarial smoothing, the return on actuarial assets has been only 6.7 percent – below the actuarially expected return over that period. See Appendix A for a discussion of actuarial versus market assets.
- 5 Aggregate data can obscure the heterogeneity among public plans. See Appendix B for data on the current distribution of plan funded status and how it has changed over time. For the reported funded ratios of individual plans, access the [PPD's Interactive Data Browser](#).
- 6 The PPD sample includes plans that are covered by Social Security and those that are not. For covered plans, the average contribution rate is estimated to be 20.8 percent of payroll in 2020, while the average rate for non-covered plans is estimated to be 21.6 percent. In 2021, covered plans average 21.3 percent and non-covered plans average 22.4 percent.
- 7 This estimate assumes that only the employer bears the burden of amortizing payments. In actuality, some plans share rising costs with employees through some form of risk-sharing. For example, Wisconsin RS and Arizona Public Safety define employee and employer contributions as a share of the total required contribution of the plan, so employee and employer costs rise proportionally if unfunded liabilities rise.
- 8 Currently, the majority of plans use an assumed return of just over 7 percent (a decline from the average 8-percent rate plans used in 2001) and backload the amortization of their unfunded liabilities by using a level percent of payroll method to calculate their actuarially determined contribution. However, the average annualized investment return for public plans from 2001-2020 is closer to 5.5 percent. Further, the more stringent approach to amortizing unfunded liabilities is to use the level dollar method that pays down a larger portion of unfunded liabilities in earlier years.
- 9 Green and Loualiche (2021).
- 10 Young (2021) surveyed government officials from 288 state and local governments in March 2021 and found that a smaller share of governments implemented furloughs and layoffs than in the aftermath of the 2008-2009 financial crisis. At the same time, a larger share indicated that retirement-eligible employees were accelerating their retirement plans.

11 Looking forward, it is quite possible that state and local hiring will rebound significantly in FY 2022. In March 2021, Congress authorized \$350 billion of state and local recovery funds as part of the American Rescue Plan Act, and these funds were explicitly intended to increase state and local hiring (and not to pay down pension obligations). As a counterpoint of comparison, however, the reduction in payrolls following the 2008-2009 financial crisis persisted into 2020 even as government revenues recovered.

12 To estimate the decline in amortization payments, the analysis applies the most recently reported amortization rate before the pandemic – roughly 14.2 percent – to two different payroll projections from March 2020 to June 2021. The first payroll projection assumes that payrolls for state and local pension plans grow at the average expected payroll growth rate. The second projection uses changes to total state and local employment and average wages reported by the BLS from March 2020 to April 2021 (and assumes no change from April to the end of FY 2021).

13 The cumulative impact of the differences between actual and expected payroll growth since 2001 has resulted in less than a 1-percentage-point lower aggregate funded ratio for plans today.

14 While the primary driver behind increased amortization payments (in dollar terms) since 2001 has been unfunded liabilities from financial downturns, two other factors have played a significant role. First, most plans have incrementally reduced their assumed investment return, which increases liability values. Second, some plans do not receive the full amount of their actuarially determined contributions from government sponsors, which increases unfunded liabilities by reducing asset growth. See Appendix C for the percentage of the actuarially determined contribution received by plans from 2001-2020.

15 Another reason to shift to a fixed-dollar amortization approach is to curb the confused tendency of some department heads to limit employment in response to rising amortization costs. Under the current funding regime, reducing employment in response to rising unfunded liability costs simply leads to inadequate amortization payments, which leads to higher unfunded liabilities, greater subsequent amortization payments, and higher reported contribution rates (due to lower payrolls). The higher contribution rates trigger further employment cuts that start the cycle all over again. This confounding pattern unfolds while government officials believe they are pulling the correct policy levers to address pension costs. A shift to fixed-dollar amortization payments would break this frustrating cycle by clearly distinguishing the amortization payment as a fixed cost unaffected by changes to the workforce.

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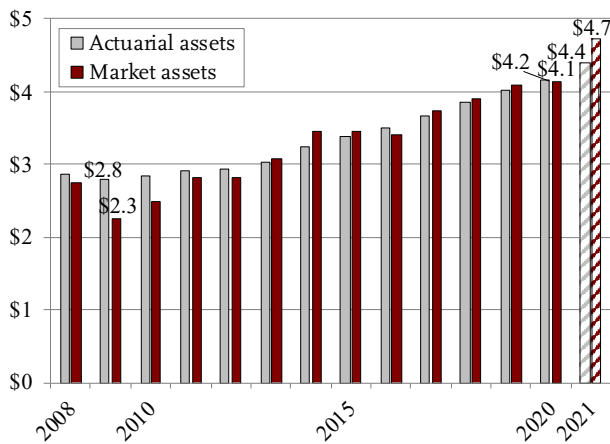
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APPENDIX

APPENDIX A. CHANGES IN ACTUARIAL ASSETS AND MARKET ASSETS

Actuarial asset smoothing limits volatility in the funded status by incrementally recognizing – typically, over five years – market gains and losses. As a result, actuarial asset values are projected to increase much less than market values in 2021 (see Figure A1).

FIGURE A1. ACTUARIAL VS. MARKET VALUE OF STATE AND LOCAL PENSION ASSETS, FY 2008-2021, TRILLIONS OF DOLLARS



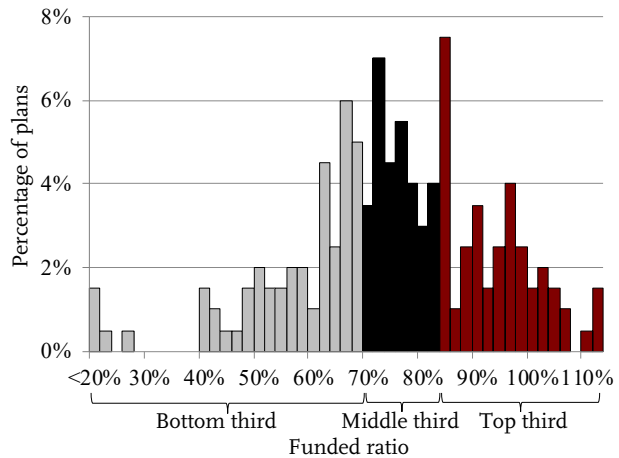
Note: 2021 numbers are authors' estimate.
Sources: Various actuarial valuations and financial reports; and PPD (2001-2020).

While this approach reduces the increase in funded levels in 2021, it will also limit declines in funded status when markets fall – as during the 2008-2009 financial crisis – because portions of the 2021 market gain will continue to be recognized incrementally in actuarial asset values.

APPENDIX B. DISTRIBUTION OF PLAN FUNDING UNDER TRADITIONAL GASB

While the aggregate funded ratio provides a useful measure of the public pension landscape at large, it also can obscure variations in funding at the plan level. Figure B1 shows the distribution of 2021 funded ratios for the 200 plans in the PPD. This figure separates PPD plans into thirds based on their current funded status (under traditional GASB methods). The funded-ratio boundaries for the three groups were 15-66 percent for the bottom third, 67-81 percent for the middle third, and 81-117 percent for the top third. The average 2021 funded ratio for each group was 54 percent for the bottom third, 74 percent for the middle third, and 93 percent for the top third.

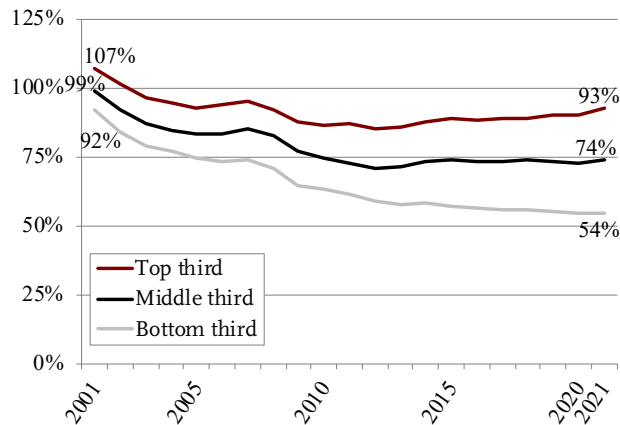
FIGURE B1. DISTRIBUTION OF PLANS BY FUNDED RATIO, FY 2021



Sources: Authors' estimates based on various plan financial reports; and PPD (2001-2020).

Figure B2 tracks the average funded status for each third from 2001-2021. While the bottom third has been consistently less funded throughout the period, the average funded ratios for all groups were above 90 percent in 2001. However, over time, the funded status of the three groups has grown apart. Much of this divergence has occurred since the 2008-2009 financial crisis as the worst-funded group has continued to deteriorate while the other two groups have stabilized. As a result, the gap between the top and bottom group in 2021 was 39 percentage points – more than twice as large as in 2001.

FIGURE B2. AVERAGE FUNDED RATIOS FOR PLANS GROUPED BY 2021 FUNDED STATUS, FY 2001-2021



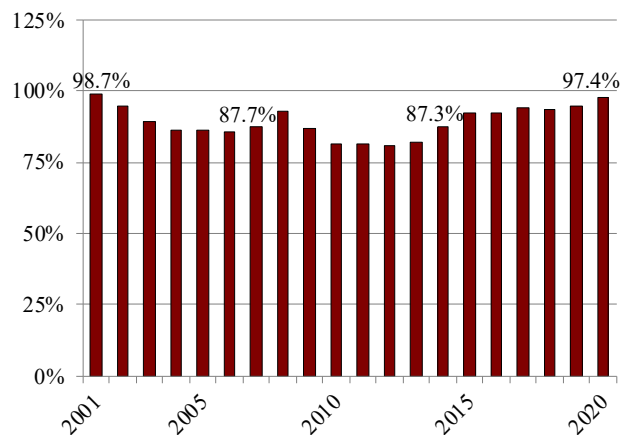
Sources: Authors' estimates based on various plan financial reports; and PPD (2001-2020).

APPENDIX C. PERCENTAGE OF ACTUARIALLY DETERMINED CONTRIBUTION PAID

Because financial and economic downturns often coincide, increases in required contributions tend to occur during periods when states and localities see a dramatic decline in their revenues. As a result, governments have historically paid a lower percentage of the required contribution immediately following major downturns as they struggle to find additional funds, but they do eventually increase their payment to meet the actuarial requirements.

Figure C1 shows how the percentage of the actuarially determined contribution paid fell in the wake of the dot.com crash of the early 2000s and the financial crisis of 2008-2009. As budgets recovered and the funded ratios stabilized as a result of stock market gains, the required contributions also stabilized and the percentage of required contribution paid increased.

FIGURE C1. AGGREGATE PERCENTAGE OF ACTUARIALLY DETERMINED CONTRIBUTION PAID, FY 2001-2020



Note: 2020 data include roughly half of PPD plans, which also represent about half of total members in PPD plans.
Sources: Various actuarial valuations and financial reports; and PPD (2001-2020).

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