

# PUBLIC PENSIONS CONTEND WITH FALLING MARKETS AND RISING INFLATION

BY JEAN-PIERRE AUBRY\*

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## Introduction

Fiscal year 2022 has been difficult for state and local pension plans – with record investment losses and rising pension outlays due to inflation. This experience is in sharp contrast to 2021, when pension funds enjoyed higher investment returns, as well as increased contributions from sponsoring governments.<sup>1</sup>

This *brief* updates the status of state and local plans as of 2021 and uses what we know about 2022 to estimate their current condition.

The discussion is organized as follows. The first section shows that, over the two-year period of 2021 and 2022, the funded ratio for public plans first rose and has since fallen back to about 74 percent. The second section explores how the recent rise in inflation affects pension outlays, arguing that limits to cost-of-living adjustments (COLAs) mute the impact of inflation on pension fund finances. The flip side, of course, is that the limited COLAs also erode the purchasing power of retiree pension benefits, which is especially harmful to those not covered by Social Security. The final section concludes that pension funds continue to muddle along, with the recent rise in inflation impacting the finances of retirees more than the pension funds themselves.

## Funded Status of Public Plans

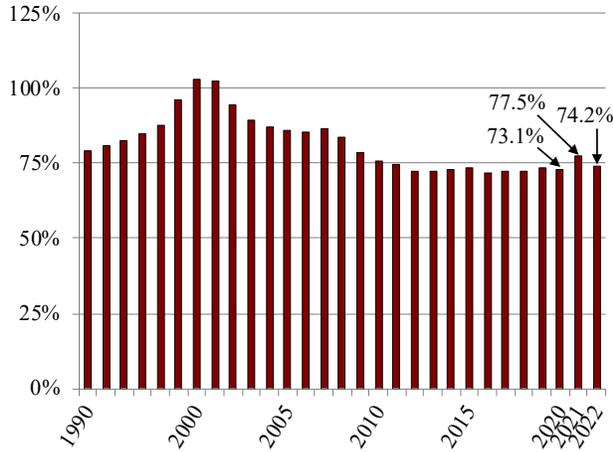
As of July 2022, just over half of the roughly 200 major state and local pension plans in the *Public Plans Database* (PPD) had reported their 2021 funded levels.<sup>2</sup> None had reported 2022 levels. To describe the current status of public plans, this analysis makes plan-by-plan projections using data provided in each plan's most recently released reports.<sup>3</sup> Based on the 2021 data and projections for 2022, the aggregate actuarial funded ratio rose by 4 percentage points in 2021 and decreased by 3 percentage points in 2022 (see Figure 1 on the next page).<sup>4</sup> Thus, despite the recent decline in the stock market, pension funded ratios have increased slightly over the last two-year period.<sup>5</sup>

The actuarially determined employer contribution rate – the rate required to keep the plan on a steady path toward full funding – dropped about 2 percentage points of payroll in 2021 from 27.9 to 26.0 percent of payroll (see Figure 2 on the next page).<sup>6</sup> But, it is estimated to return to 27.9 percentage points in 2022.<sup>7</sup> Virtually all of the increase in contribution rates over the past decade has stemmed from an increase in the amortization payments to cover rising unfunded liabilities.<sup>8</sup> Today, the portion of the

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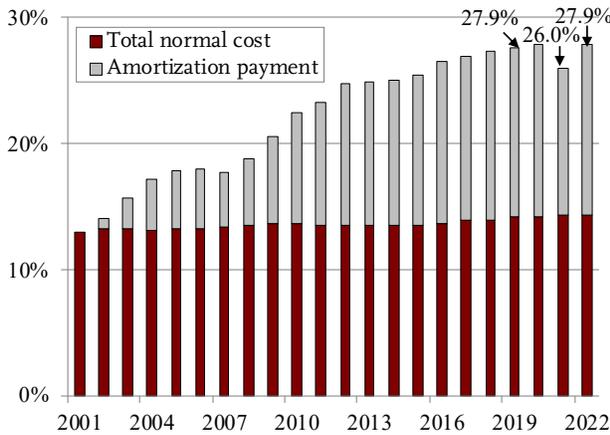
FIGURE 1. AGGREGATE FUNDED RATIO FOR STATE AND LOCAL PENSION PLANS, FY 1990-2022



Sources: Author’s estimates based on various plan financial reports; and *Public Plans Database* (PPD) (2001-2021).

required contribution dedicated to paying down unfunded liabilities is about 14 percent of payroll (see the gray bars in Figure 2).<sup>9</sup>

FIGURE 2. REQUIRED ANNUAL CONTRIBUTION AS A PERCENTAGE OF PAYROLLS, FY 2000-2022



Sources: Author’s estimates based on various plan financial reports; and PPD (2001-2021).

Importantly, many pension researchers (and some practitioners) question the adequacy of actuarially determined contributions as they are typically 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 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 2022 would rise from 27.9 to 39.2 percent of payroll.<sup>10</sup>

## Rising Inflation and Public Plan Finances

In addition to the recent stock market decline, public plans face the challenge of higher future outlays due to inflation. In June 2022, the Consumer Price Index for All Urban Consumers rose at a 12-month pace of 9.1 percent – a rate not seen in four decades (see Figure 3).

FIGURE 3. MONTHLY YEAR-OVER-YEAR INCREASE IN THE CPI-U, JUNE 1980 TO JUNE 2022



Source: U.S. Bureau of Labor Statistics (2022).

Inflation puts direct pressure on public pension finances because, unlike defined benefit plans in the private sector, these plans provide some form of COLA. While these adjustments are far from straightforward, they can be grouped into four main categories as summarized below.

*Fixed rate:* an automatic annual adjustment that is a constant percentage or dollar amount not directly tied to the CPI. For example, Hawaii ERS provides a 1.5-percent annual increase for those hired after 2012 and a 2.5-percent annual increase for those hired prior.

*Ad-hoc*: an adjustment made at the discretion of the retirement system board or the legislature. These adjustments often occur intermittently and do not necessarily reflect current inflation. For example, the North Carolina legislature approved one-time COLAs in 2016 (1 percent), 2018 (1 percent), 2021 (2 percent), and 2022 (3 percent).

*Investment-based*: an adjustment that is tied to some financial metric, generally the plan’s overall funded level, investment return, or level of assets in a special COLA fund. For example, the COLA for members of Arizona SRS who were hired before 2013 is contingent on SRS earning more than an 8-percent investment return on its actuarial assets.

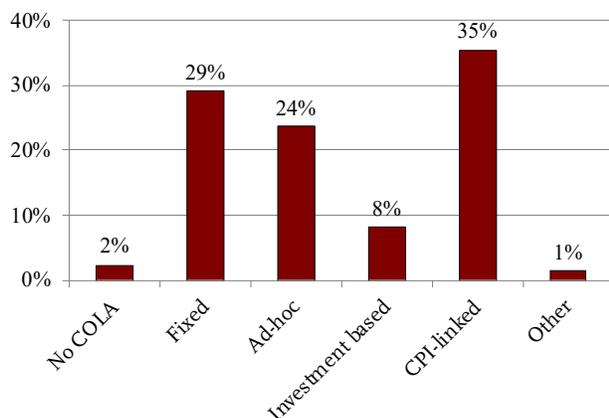
*CPI-linked*: an automatic annual adjustment tied to the CPI. Even this seemingly straightforward approach, however, appears with limits and caps.

While rising inflation could lead to higher payments for plans with all COLA types (e.g., pressure from retirees struggling with high inflation could convince boards and legislatures to grant ad hoc benefit increases), it should – almost by definition – impact plans that have an automatic CPI-linked COLA.<sup>11</sup> The questions are how prevalent are these types of COLAs and how big an increase in costs are we likely to see.

### The Impact of CPI-Linked COLAs

Currently, just over a third of major state and local public plans provide CPI-linked COLAs to their current retirees (see Figure 4).<sup>12</sup> A closer look at these

FIGURE 4. DISTRIBUTION OF STATE AND LOCAL PLANS, BY COLA FOR CURRENTLY RETIRED MEMBERS



Sources: Author’s estimates based on various plan financial reports; NASRA (2022); and PPD (2001-2021).

plans reveals that they are larger (in terms of assets), better funded, more likely to be locally administered, and more likely to be public safety (i.e., police and/or fire) plans.

The vast majority of plans with CPI-linked COLAs cover only a portion of annual inflation increases and/or place caps on the maximum COLA (see Table 1).<sup>13</sup> On average, CPI-linked plans guarantee about 85 percent of the CPI increase up to a maximum of 3.5 percent. As a result, the impact of higher-than-expected inflation on the benefit payouts will be somewhat muted.

TABLE 1. BREAKDOWN OF CPI-LINKED COLAs, BY INDEXATION AND CAP

COLA type	Share of CPI-linked plans
Fully-indexed, no cap	6.4%
Fully-indexed, cap	62.8
Partially-indexed, no cap	3.8
Partially-indexed, cap	26.9
Total	100.0%

Sources: Author’s estimates based on various plan financial reports; Brainard and Brown (2022); and PPD (2001-2021).

One way to illustrate the impact that high rates of inflation have on CPI-linked plans is to calculate the increase in the present value of future benefits (i.e., the pension liability) for a hypothetical retiree covered by various CPI-linked COLA policies under two inflation scenarios.<sup>14</sup> The first scenario presumes inflation matches plans’ average assumptions, holding steady at 2.5 percent each year.<sup>15</sup> The second scenario presumes that inflation is 8 percent for two years, then steadily falls back to 2.5 percent over the following two years and holds steady thereafter.<sup>16</sup>

This simple calculation suggests that, with 100 percent adjustment and no cap, outlays would be 14.8 percent higher under the second scenario with high inflation. But, as noted, most COLAs are capped and involve partial indexing, so that high inflation for the next few years would increase retiree liabilities between 1.8 and 5.7 percent for most CPI-linked plans (see shaded area in Table 2 on the next page). In turn, this would increase amortization payments between 0.4 and 1.6 percent of payroll – a relatively modest increase given the 28.5-percent contribution rate estimated for 2022.<sup>17</sup>

TABLE 2. IMPACT OF BRIEF HIGH-INFLATION PERIOD ON THE PRESENT VALUE OF LIFETIME BENEFITS

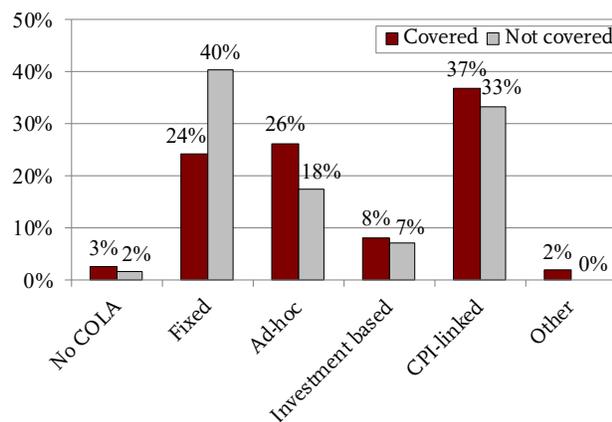
CPI-index	COLA cap			
	2.5%	3.0%	3.5%	No cap
50%	3.5%	4.7%	5.7%	7.2%
75%	1.8	3.2	4.6	11.0
100%	0.0	1.4	2.8	14.8

Note: Shaded area = partially indexed or capped COLAs.  
Source: Author's estimates.

### Impact on Retirees

The flip side of inflation's muted impact on pension fund finances due to limited COLAs is, of course, the eroding of purchasing power of retiree pension benefits. This impact is especially harmful to the 25 percent of state and local workers not covered by Social Security, which provides fully-indexed retirement benefits.<sup>18</sup> Looking at the COLAs by whether a plan is covered by Social Security reveals some interesting differences. First, noncovered plans are more likely to have fixed-rate COLAs and less likely to have ad-hoc provisions – they are only slightly less likely to have CPI-linked COLAs (see Figure 5).

FIGURE 5. DISTRIBUTION OF STATE AND LOCAL PLANS, BY COLA FOR CURRENTLY RETIRED MEMBERS



Sources: Author's estimates based on various plan financial reports; NASRA (2022); and PPD (2001-2021).

Second, the average fixed-rate COLA for noncovered plans is only 3 percent – so these types of COLAs do not fully protect retirees during periods of very high inflation. Finally, the CPI-linked COLAs for noncovered plans are less likely to be capped than those for covered plans, but the overwhelming majority still cap their CPI-linked COLAs (see Table 3). So, the real value of benefits provided by most noncovered plans is likely to erode during periods of high inflation.

TABLE 3. BREAKDOWN OF CPI-LINKED COLAs, BY INDEXATION, CAP, AND SOCIAL SECURITY COVERAGE

COLA type	SS covered	Not SS covered
Fully-indexed, no cap	3.4%	15.8%
Fully-indexed, cap	61.0	68.4
Partially-indexed, no cap	5.1	0.0
Partially-indexed, cap	30.5	15.8
Total	100.0%	100.0%

Source: Author's estimates based on various plan financial reports; NASRA (2022); and PPD (2001-2021).

## Conclusion

In 2021, pension funds enjoyed higher investment returns and sponsoring governments were able to make their required pension contributions due to the fiscal windfalls stemming from federal COVID relief and increased tax revenue. Unfortunately, 2022 has been a very different story – with record investment losses and rising pension outlays due to inflation.

Overall, this update finds that, over the two-year period of 2021 and 2022, the funded ratio for public plans first rose and has since fallen back to about 74 percent. Additionally, limits to the COLAs provided by plans mute the impact that rising inflation will have on public pension finances. The flip side is that the limited COLAs also erode the purchasing power of retiree pension benefits, which is especially harmful to those not covered by Social Security. The big unknown, of course, is whether such high inflation will result in changes to current COLA policies to provide greater inflation protection for retirees – which would cost plans more.

## Endnotes

1 Aubry and Wandrei (2021).

2 The [PPD](#) contains financial data from 2001 to the present (based on the latest available data) for 215 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 U.S. Aggregate Bond Index for fixed income; S&P Treasury Bill 3-6 Month Index for cash; S&P Listed Private Equity Index for private equity; HFRI 500 Fund Weighted Composite Index for hedge funds; S&P GSCI for commodities; and S&P U.S. Real Estate Index for real estate. For cash flows, contributions and benefits grow based on each plan's annualized growth over the most recent for a five-year period. 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 Aggregate data can obscure the heterogeneity among public plans. See Appendix A for data on the current distribution of plan funded status and how it has changed over time. For the most recent funded ratios reported by individual plans, access the [PPD's Interactive Data Browser](#).

5 The ups and downs of the market have a muted impact on the funded ratio because of the actuarial smoothing techniques used when reporting actuarial assets. But, even using market assets, current funded ratios are similar to 2020. See Appendix B for a discussion of actuarial versus market assets.

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 26.5 percent of payroll in 2022, while the average rate for non-covered plans is estimated to be 31.8 percent.

7 See Appendix C for a discussion on the percentage of required contributions that pension funds actually receive from sponsoring state and local governments.

8 In addition to rising unfunded liabilities, low payroll growth has also contributed somewhat to rising contribution rates by lowering the base over which amortization costs are expressed.

9 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.

10 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 over the past 10 years (including this most recent downturn) has been 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.

11 The COLA for some non-CPI-linked plans might also be *automatically* altered by a significant increase in the CPI. For example, some fixed-rate COLAs stipulate automatic increases in the fixed rate once certain CPI thresholds are breached. Additionally, some plans have semi-automated decision-making processes for determining ad-hoc COLAs that tend to result in annual COLAs that closely follow CPI.

12 While many plans altered their COLAs in the wake of the global financial crisis, the changes often impacted new hires only. This *brief* focuses on the COLA benefits currently being offered to the majority of retired plan members, because it is their COLAs that will be directly affected by the recent rise in inflation rates. In addition, inflation would also have some impact on wages, which would ultimately increase long-term costs for pension funds.

13 Of the uncapped CPI-linked plans, only one – Jersey City Municipal – has a funded ratio below 72 percent. In fact, five of the six plans have funded ratios above 80 percent.

14 For this analysis, future benefits are discounted at 7.1 percent – the average discount rate used by major state and local pension plans. With lower discount rates, the difference in benefits scheduled in later years – due to greater COLA increases in the earlier years – would be more valuable and the difference in liabilities greater.

15 The average inflation assumption for public pensions has steadily declined since 2001 – from 4 percent to about 2.5 percent. See Aubry, Munnell, and Wandrei (2018) for more on how the inflation assumption impacts public pension finances.

16 As of June 2022, the University of Michigan reports the U.S. Inflation Expectations for the next 12 months to be 5.3 percent. As of July 11, 2022, the Federal Reserve Bank of St. Louis reports the 5-year breakeven inflation rate (the difference between the interest rate on 5-year Treasury Bonds and 5-year TIPS) as 2.56 percent.

17 Based on the fact that retiree liabilities make up about half of total pension liabilities, a 1.4- and 6-percent increase in retiree liabilities translates to a 1- and 3-percent increase – respectively – in the total liability ( $.018/.5=.009$  and  $.057/.5=.0285$ ). Based on the 74-percent funded ratio in 2022, a 1- and 3-percent increase in the total liability translates to a 3- and 11-percent increase – respectively – in the total unfunded liability ( $.009/.26=.03$  and  $.0285/.27=.11$ ). Based on the 14-percent amortization rate in 2022, this translates to about a 0.4- and 1.6-percent increase in the contribution rate ( $.141*.03=.004$  and  $.141*.11=.016$ ).

18 For more on how public pension retirement benefits for noncovered workers compare to those provided by Social Security, see Aubry et al. (2022).

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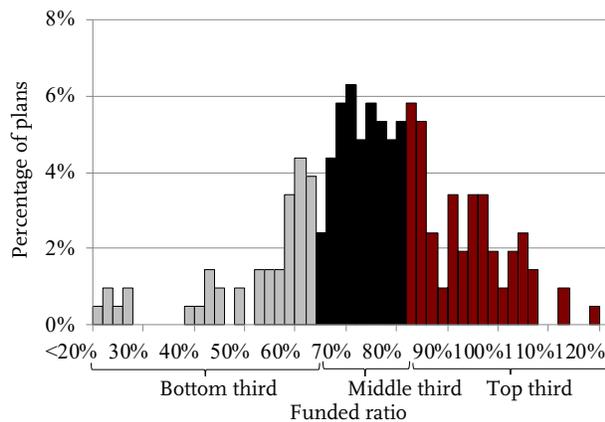
# APPENDIX

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## Appendix A. Distribution of Plans' Actuarial Funded Ratio

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 A1 shows the distribution of 2022 funded ratios for the 220 plans in the PPD. This figure separates PPD plans into thirds based on their current actuarial funded status. The funded-ratio boundaries for the three groups were 15-67 percent for the bottom third, 68-81 percent for the middle third, and 82-117 percent for the top third. The average 2022 funded ratio for each group was 54 percent for the bottom third, 75.3 percent for the middle third, and 88.4 percent for the top third.

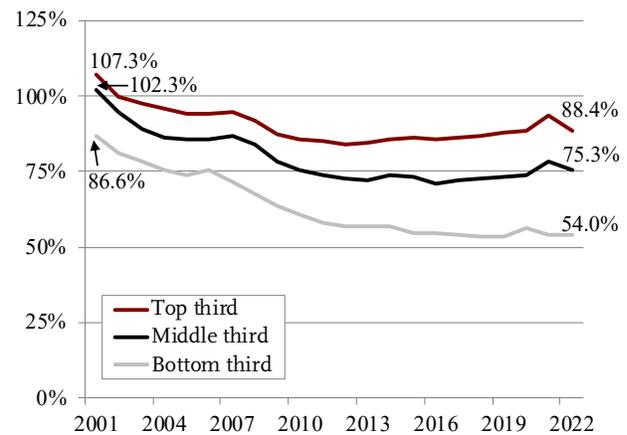
FIGURE A1. DISTRIBUTION OF PLANS BY FUNDED RATIO, FY 2022



Sources: Author's estimates based on various plan financial reports; and PPD (2001-2021).

Figure A2 tracks the average funded status for each third from 2001-2022. While the bottom third has been consistently less funded throughout the period, the average funded ratios for all groups were above 85 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 groups in 2022 was 34.4 percentage points – much larger than in 2001.

FIGURE A2. AVERAGE FUNDED RATIOS FOR PLANS GROUPED BY 2022 FUNDED STATUS, FY 2001-2022

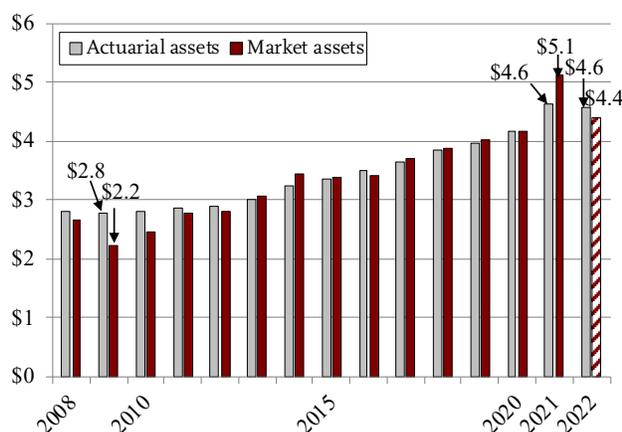


Sources: Author's estimates based on various plan financial reports; and PPD (2001-2021).

## Appendix B. Changes in Actuarial 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 decrease much less than market values in 2022 (see Figure B1).

FIGURE B1. ACTUARIAL VS. MARKET VALUE OF STATE AND LOCAL PENSION ASSETS, FY 2008-2022, TRILLIONS OF DOLLARS



Sources: Author’s estimates based on various plan financial reports; and PPD (2001-2021).

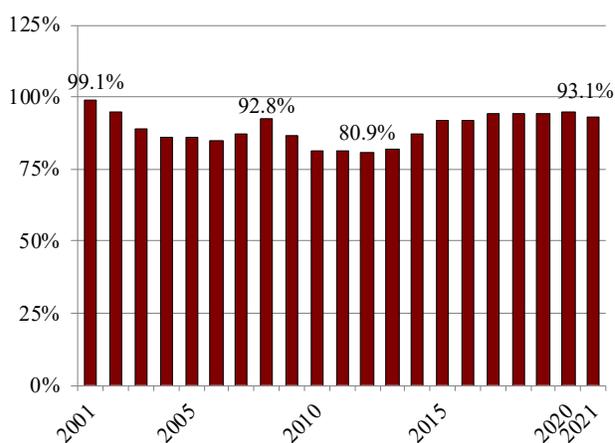
This approach limits the decline in funded levels in 2022 – as during the 2008-2009 financial crisis – but it will also reduce the increase in funded status when markets rebound because portions of the 2022 market loss will continue to be recognized incrementally in actuarial asset values.

## 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 payments 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 ACTUARILY DETERMINED CONTRIBUTION PAID, FY 2001-2021



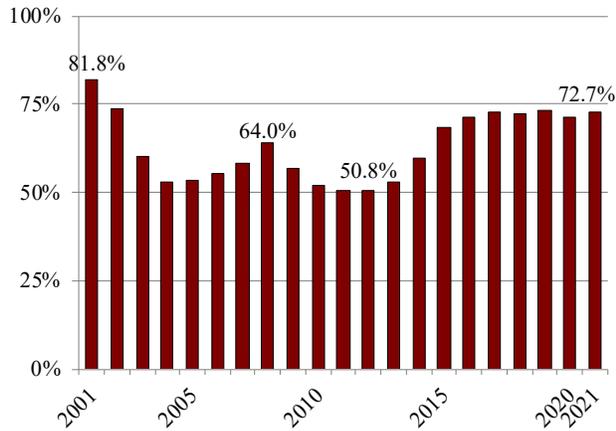
Note: 2021 data include about 60 percent of PPD plans, which also represent about half of total members in PPD plans.

Sources: Various actuarial valuations and financial reports; and PPD (2001-2021).

Interestingly, the share of plans that receive their required contributions in full also fluctuates over time but never drops below 50 percent (see Figure C2 on the next page). This pattern suggests two types of

sponsoring governments – one that is committed to full contributions and another that rarely pays in full with fluctuating levels of underpayment dependent on fiscal circumstances.

FIGURE C2. SHARE OF PLANS PAYING THE FULL ACTUARIALLY DETERMINED CONTRIBUTION, FY 2001-2021



Note: 2021 data include about 60 percent of PPD plans, which also represent about half of total members in PPD plans.

Sources: Various actuarial valuations and financial reports; and PPD (2001-2021).

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