



State Pension Contributions Hit Important Benchmark

Retirement systems have an opportunity to achieve long-term sustainability

Overview

Since The Pew Charitable Trusts first evaluated the fiscal health of states' public sector pension systems in 2007, these retirement plans have varied widely, both across states and year over year, in their ability to cover the costs of promised benefits with the assets they had on hand. But in 2020, pension systems, collectively, met a crucial benchmark for minimum plan funding for the first time since 2001. As a result, states are now positioned to sustainably fund their pension promises for the long run—if they make smart policy choices to seize this opportunity.

The stabilization of state pension funding levels reached in 2020 was largely driven by an increase in employer and employee contributions. This growth has helped plans correct for past underfunding: Since 2007, states have more than doubled their annual contributions, which improved the stability of pension funding but also stressed state budgets, leaving less money available to spend on other priorities.

Strong investment returns in 2021 gave pension plan balance sheets a boost, but subsequent turmoil in financial markets, including a 6% to 8% estimated average loss on plan investments in fiscal year 2022, erased much or all of those gains, bringing plan funding close to pre-pandemic levels. This volatility serves as a reminder that although states cannot count on outsize investment returns to bail out underfunded pension plans, effective policies, in particular increases in employer contributions, offer a foundation that can achieve long-term fiscal sustainability.

To continue making progress despite uncertain economic conditions, state policymakers and pension plan administrators will need to build on their recent fiscal discipline and implement additional best practices, such as the innovative approaches implemented in states that have sustainably funded pension promises over the past 20 years. Successful states have not only consistently met contribution benchmarks, but also have adopted policies to manage risk, keep employers' costs relatively low and stable, and avoid saddling future generations of taxpayers with a bill or straining state budgets. These policies include making extra payments to accelerate the process of paying down pension debt—the amount of unfunded benefit obligations—and build a cushion against the next downturn; employing realistic investment return assumptions; designing benefits that adjust based on investment performance or on a plan's funding level; and conducting stress testing to help policymakers understand and plan for risk.

This brief looks at the current state of pension funding and the recent progress on contributions, and it explores these promising policies in more depth to help policymakers and other pension stakeholders make informed decisions about the best strategies to ensure fiscal sustainability for their state plans.

Increased contributions have set the stage for more stable systems

After a decade of policy improvements, which included benefit reforms and changes to actuarial assumptions, states in 2020 collectively met Pew's "net amortization benchmark" for the first time since Pew began tracking it in 2014. The benchmark, which adjusts each year, is a measure of whether pension contributions are sufficient to keep pension debt from growing on an annual basis, assuming investments hit their target rates of return and demographic assumptions about salaries, worker retention, and retiree longevity hold true.

In 2020, the aggregate net amortization benchmark for all state pension plans was equal to \$125 billion in contributions from states and other participating public employers, such as towns, cities, and school districts to state pension plans. Actual contributions, plus interest, in that year equaled \$130 billion, exceeding the benchmark by more than \$5 billion. Further, 38 states met or exceeded their individual net amortization benchmarks in 2020, up from just 17 states in 2014. This improvement means that even though the national funded ratio dropped from 71% in 2019 to 69% in 2020 because of market losses at the start of the COVID-19 pandemic, public employers still appear poised to make progress on paying down pension debt.

From 2000 to 2013—before establishing its net amortization benchmark—Pew evaluated the adequacy of plans' contributions by comparing employer contributions against the "actuarial recommended contribution"—the annual amount that plan actuaries said was needed to fund pension benefits. Collectively, states made the actuarial recommended contribution in 2001, but they then fell short in 2002 because of the stock market crash and failed to catch up for almost two decades.

In short, 2020 marked the first time in 18 years that state pension plans received, in aggregate, contributions above the minimum necessary threshold to fund promised benefits, as measured by the actuarial recommended contribution from 2000 to 2013 and the net amortization benchmark from 2014 onward. More than a decade of steady increases set the stage for this success: From 2007 to 2020, employer contributions grew at an annual rate of 7% and more than doubled from \$50 billion to \$130 billion.

Pension cash flow situation improves

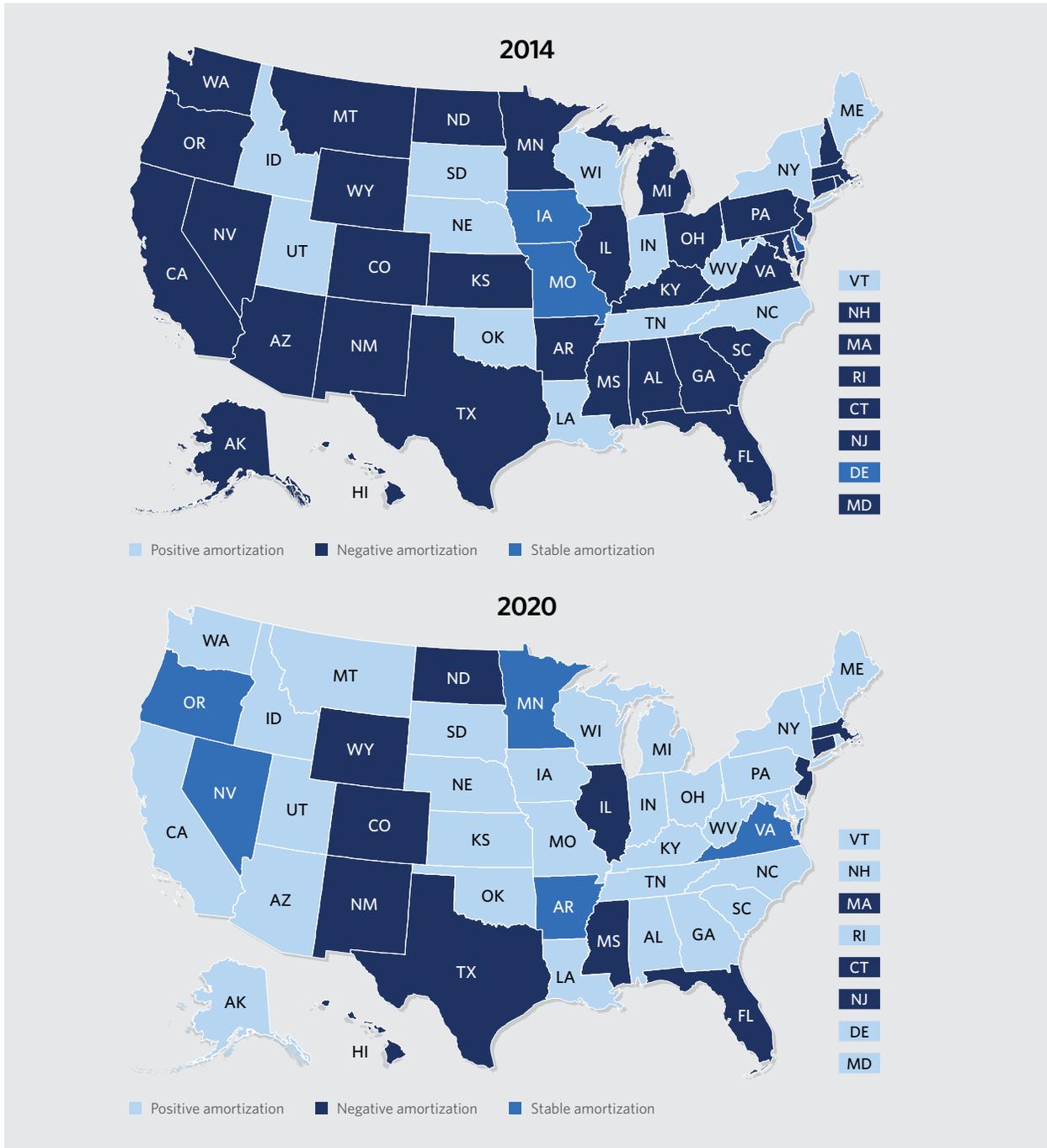
The increase in employer contributions seen in the fiscal 2020 data has improved state pension plans' cash flow position. Pew tracks plans' operating cash flow—the difference between benefit payments going out and contributions coming in—and compares that amount to the assets the plans hold, yielding the cash flow-to-assets ratio. This calculation allows Pew to evaluate each pension fund's level of dependence on investment performance and provides a metric for assessing plans' risk of asset depletion and insolvency. A typical mature pension plan, that is, one with a significant number of participants who have retired and are collecting benefits, will have negative operating cash flow, with plan administrators expecting to make up the difference with investment returns. A ratio of -3%, for example, means that the pension plan will need investment returns of 3% or higher to offset that negative cash flow and avoid having to sell off assets to pay promised benefits.

A cash flow-to-assets ratio that gets too low can be a warning sign of financial risk. A persistent ratio below -5% could result in asset levels dropping over time as assets are sold to make benefit payments should contributions and investment returns prove insufficient. This in turn could lead to insolvency if investment returns average less than 5%—a plausible scenario should financial markets underperform expectations. In 2014, six states had ratios below -5%; by 2020, thanks to states' improved fiscal discipline, every state was above that threshold.

Figure 1

The Number of States Meeting or Exceeding Contribution Targets More Than Doubled Over 6 Years

Amortization status by state, 2014 and 2020



Source: Pew calculations based on data from state comprehensive annual financial reports, actuarial valuations, and data provided by government officials and plan administrators

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Some poorly funded states turned pensions around

Kentucky and Pennsylvania were among the states that met the amortization benchmark in 2020. Their pension systems had previously faced some of the country's most significant challenges with unfunded benefit increases, prior contribution shortfalls, and ineffective management of risk and investment volatility. But after substantially reforming their contribution policies, each state met its amortization target in 2019 and then maintained that performance. Policymakers in the two states not only made changes to correct past mistakes, but they also established new plans and policies to stabilize costs and reduce the risk of future spikes in contribution rates.

For example, Pennsylvania struggled with rising pension debt resulting from unfunded benefit increases and a persistent failure to make annual required contributions. In 2010, the state started turning this around, ultimately increasing annual employer contributions from \$1 billion in 2010 to more than \$6 billion in 2020. Pennsylvania officials also instituted reforms to minimize the risk of future funding crises, including adopting a risk-managed hybrid plan design for new workers, improving plan governance and transparency, significantly reducing investment fees, and using stress tests to give budget officials and policymakers a clear picture of investment risks and anticipated employer costs should investment returns fall short of expectations. Pennsylvania's Independent Fiscal Office estimated that these changes will provide up to \$20 billion in relief over 30 years to the budgets of the state and local school districts in the form of reduced employer contributions, stronger public balance sheets, lower investment fees, and protection against a financial downturn.¹ This all makes Pennsylvania's reforms an impressive turnaround story as well as an example of how deliberate, consistent policy improvements can push even an underfunded state toward success and sustainability.

Similarly, Kentucky—which had previously experienced one of the worst funding declines of any system in the country, falling from a surplus in 2000 to less than 50% funded by 2012—committed to fully funding first its public employee retirement system in 2013 and then its teacher retirement system four years later. These funding changes were paired with new plan designs aimed at reducing risk and managing volatility and the creation of an oversight board to increase transparency and help policymakers make informed choices. Thanks to these efforts, Kentucky not only met but exceeded amortization targets in 2019 and 2020.

Rising costs can crowd out other priorities

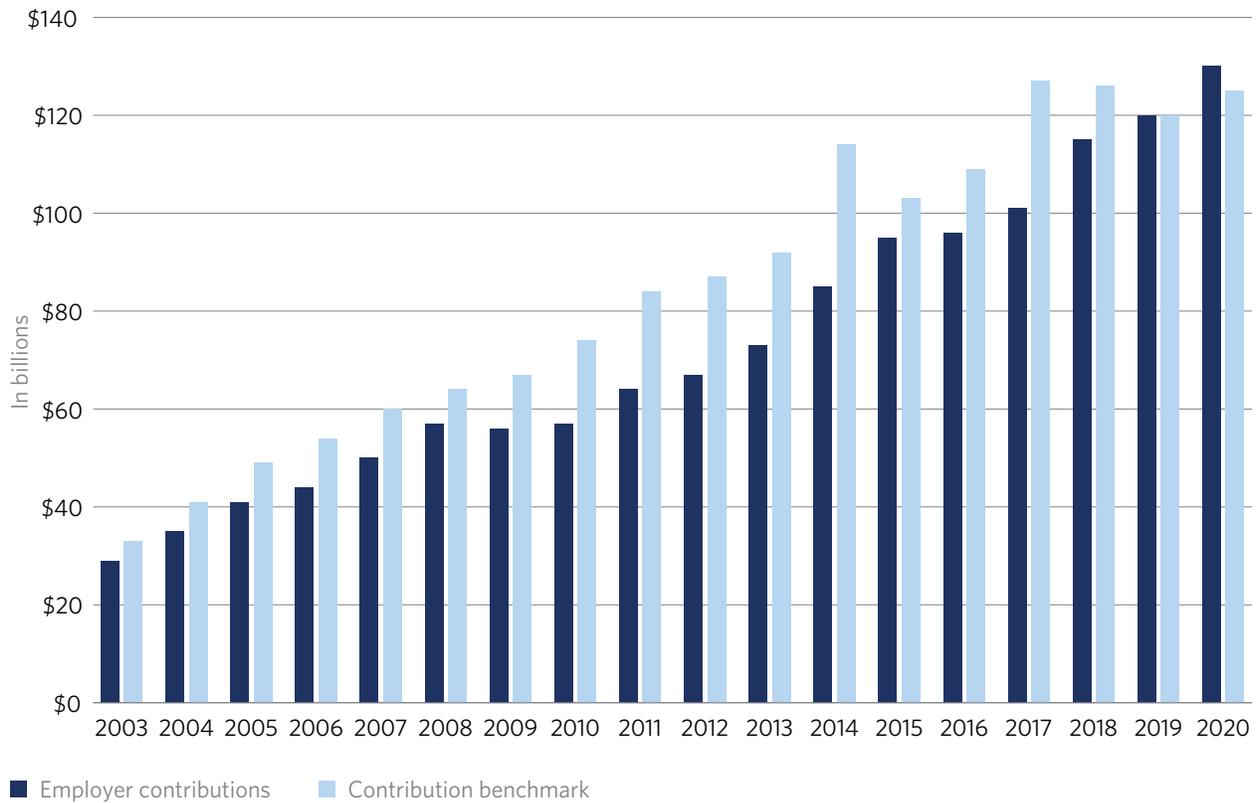
Nationwide, however, the rise in pension contributions, though necessary to bolster the fiscal health of state retirement systems, also created budget challenges. The 7% annual growth in employer contributions from 2007 to 2020 allowed plans to catch up to actuarial recommendations and amortization benchmarks. But because state revenue grew at less than half that rate over the same period, the share of public resources going toward pension contributions rose significantly, sapping more than \$300 billion in state and local funding that might otherwise have been available for other spending priorities.

The contribution benchmark for state pension plans also grew over this period. In 2007, plan actuaries recommended contributions of \$60 billion—of which states paid only \$50 billion—but the figure rose rapidly to \$87 billion in 2012. By 2017, the benchmark was more than \$120 billion. (See Figure 2.) This growth reflected the combined impact of investment returns that fell short of expectations, the costs of catching up on prior missed contributions, and a shift among plans to using more realistic financial assumptions than in the past.

Figure 2

Employer Contributions Caught Up to Rising Targets by 2020

Contribution benchmarks and employer contributions, 2003-20



Note: From 2003 through 2013, the contribution benchmark reflected the aggregate actuarial recommended contribution for state pension plans. Starting in 2014, it was changed to measure net amortization. Also beginning in 2014, employer contributions figures include half a year's interest to adjust for timing.

Sources: State comprehensive annual financial reports, actuarial valuations, and data provided by government officials and plan administrators

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Market volatility highlights need for risk management plans

Although funded ratios have primarily trended downward since 2003, Pew's estimates had indicated that the aggregated ratio would show substantial improvement, reaching approximately 84% of liabilities, when states release their fiscal 2021 pension data thanks to strong market returns that year. But because recent market turmoil has erased much of pension plan's recent investment gains, Pew now projects the figure as about 74% as of June 2022. These developments make clear that the long-term success and sustainability of public pension funds will depend primarily on fiscal discipline and effective policy rather than on investment markets.

The funding progress that states have made by increasing contributions to their pension systems is an important success story for taxpayers, public sector workers, and retirees. But it is not without consequences for state budgets. The surest way for states to ensure that retirement commitments do not undermine their budgets and spending priorities is to put policies in place that reliably provide the resources needed to pay for promised

benefits while also managing risk and uncertainty. Otherwise, they will have to either devote a growing share of public resources to pension costs or accept funded ratios that fluctuate with volatile financial markets. Fortunately, several states provide examples of effective approaches to maintaining high pension funding levels while keeping employers' annual costs stable.

States have a unique opportunity to achieve pension fiscal balance

The combination of states' improving fiscal responsibility and recent budget surpluses presents an opportunity for states to make pivotal changes that could bolster the sustainability of public pensions and promote predictable costs and contributions in the future. High-performing states with well-funded pension plans and stable costs show that such success is achievable and provide blueprints for policymakers in other jurisdictions to follow.

States with consistently high funding ratios can require smaller employer contributions while ensuring that workers and retirees can count on receiving promised benefits. The 10 states with the best-funded pension plans—at least 85% funded in 2020—contributed 12% of payroll to their plans annually, on average, and all met or exceeded the contribution benchmark in 2020. By contrast, the 10 worst-funded states were less than 60% funded in 2020 and had an average employer contribution rate of 27% of payroll—and all but three fell below the contribution benchmark in 2020.²

A deeper look into the top 10 states, however, reveals big differences in pension policies and the likelihood that plans will remain well funded and that costs will stay stable. Five of these states—Idaho, Nebraska, South Dakota, Tennessee, and Wisconsin—implemented policies, such as plan designs that shared gains and losses among employers, employees, and retirees, that kept employer contribution rates relatively stable from 2007 to 2020. Contribution rates fluctuated by less than 3% of payroll despite national and global financial uncertainty and enabled budget officials to make reasonable projections of future costs and plan accordingly. Further, because these “top tier” states kept their pension plans well funded throughout this period, they did not face the trade-offs between annual budgets and pension plan balance sheets that other states confronted during financial downturns.

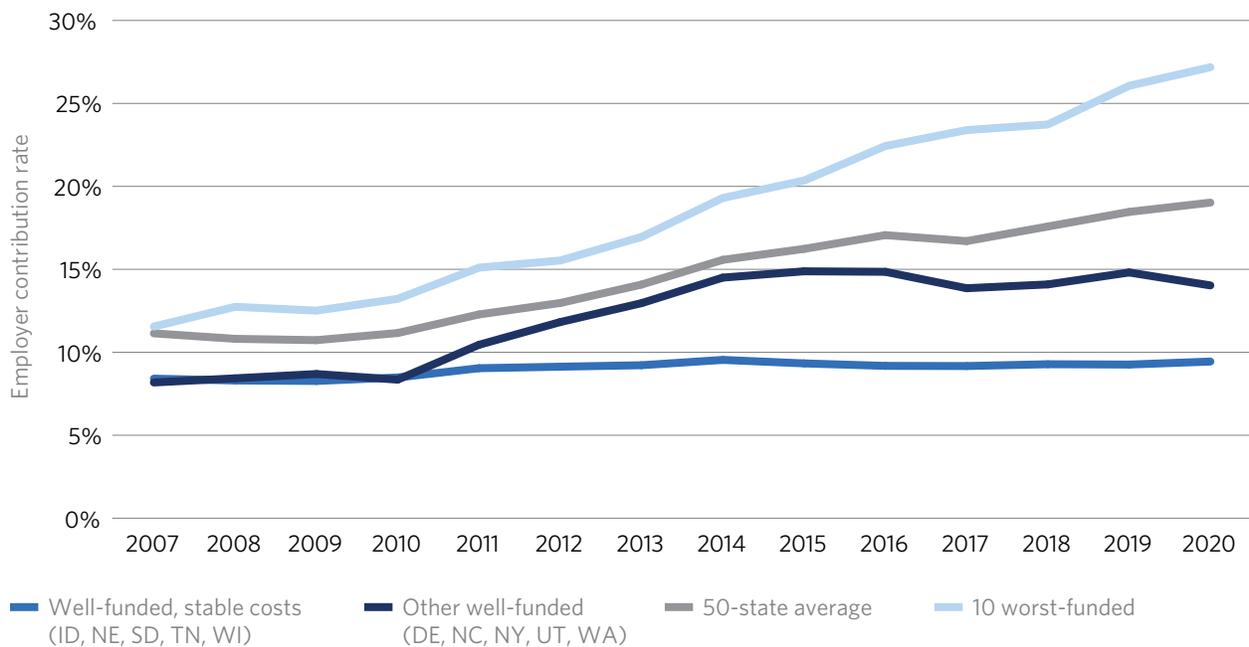
In contrast, although the five states in the next tier—Delaware, New York, North Carolina, Utah, and Washington—also had well-funded plans, they lacked policies to manage costs and volatility and so saw contribution rates fluctuate in parallel with financial market ups and downs. New York provides a particularly useful example. The amount that participating employers contributed to the state's pension plans rose from 11% of payroll in 2007 to 21% in 2014 and then dropped to 16% of payroll by 2017 as financial markets strengthened and New York's pension balance sheet improved. And although New York and the other four states in its tier fared better than the typical state in terms of costs—averaging 13% of payroll from 2010 to 2020 compared to a 50-state average of 16%—and funded ratio—averaging 90% funded compared to a 50-state funded ratio of 69%—when compared with the top tier, their experience with variable costs clearly shows that even some well-funded states have room for improvement.

As Figure 3 shows, top tier states were able to hold employer contributions relatively low and constant from 2007 to 2020, while the next tier of states saw contribution rates rise over the same economically volatile period. Stable and low costs can help retirement systems avoid financially burdening state and local employers, especially during economic downturns. So, although all 10 well-funded states demonstrate that fiscal discipline is an important and necessary tool for sustainability, the top tier also shows that discipline can be combined with cost predictability to ensure delivery of promised benefits over the long term without crowding out other important public investments.

Figure 3

States With Well-Funded Pension Liabilities Were Best Able to Keep Retirement Costs Stable

Employer contribution trends, by funding status and national average, 2007-20



Sources: State comprehensive annual financial reports, actuarial valuations, and data provided by government officials and plan administrators

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Model retirement systems offer blueprints for success

Every state is different, but a close look reveals that despite different plan designs, funding policies, and approaches to governance, South Dakota, Tennessee, and Wisconsin share important approaches. In particular, all three states provide a path to retirement security for long- and shorter-term workers and employ risk management policies—such as sharing gains and losses among employers, workers, and retirees—to ensure they can provide those benefits while holding costs stable at sustainable levels.

- The **South Dakota Retirement System** uses a variable cost-of-living adjustment (COLA)—an annual increase in retiree benefits designed to protect against inflation—to maintain a fully funded system with statutorily fixed employer and employee contribution levels. In the event of an investment shortfall or other change that reduces funding levels, the maximum allowable COLA also adjusts downward. In addition, plan administrators employ a relatively conservative 6.5% assumed rate of return, which helps reduce the risk of missing the investment target and incurring unexpected costs during market downturns. One unusual feature of South Dakota’s benefit design is an inflation indexing provision that guarantees a meaningful benefit for employees who leave a public sector job early or midcareer. By applying an annual COLA to departed workers’ final salaries, the system ensures that inflation does not erode those workers’ benefits before retirement.

- **Tennessee** adopted a hybrid benefit design with risk-sharing features in 2013 for new state employees and teachers. This benefit structure combines a pared down defined benefit (DB) plan, which gives workers a limited fixed benefit, with a defined contribution (DC) plan, such as a 401(k), that provides a fixed cost for employers. Employees' final benefits are the total of the DB benefit plus a DC benefit that is dependent on investment performance.

Tennessee's design includes risk management tools to keep employer costs stable, perhaps the most innovative of which is the reserve fund. Employer contributions to the pension plan are set above the actuarially determined level needed to ensure the plan is well funded, and the excess amount is set aside in the reserve fund to cover unexpected future costs. If the amount set aside proves insufficient, pension benefits automatically adjust to bring costs in line with the target employer contribution rates, which the state set at 9%: 4% for the DB plan and 5% for the DC plan.

- The **Wisconsin Retirement System** is designed to distribute investment shortfalls or gains that deviate from the plan's stated expectations such that employers, employees, and retirees share the cost of poor returns and the rewards of strong performance. While employees are working, their contributions and those from their employers rise and fall equally in response to market conditions. Once retirees start to draw their pensions, the estimated cost of their benefits is set using a conservative return assumption of 5%, and retirees receive COLAs only if investment returns beat that threshold. And to protect against market risk and volatility, COLAs also can be suspended or rescinded if plan funding drops. As these examples show, policymakers can maintain high funding levels, stable costs, and adequate benefits using a variety of approaches.

Despite their different plan designs, South Dakota, Tennessee, and Wisconsin share a commitment to setting and achieving explicit employer cost targets, while still meeting retirement security needs across the workforce, and to proactively managing risk. For states such as Pennsylvania that have faced challenges managing negative consequences of past policy choices, these strategies, together with recent improvements to funding policy and strengthened balance sheets and budgets, offer a chance to achieve similar results.

Policymakers can learn from promising practices

Successful pension systems, like those in South Dakota, Tennessee, and Wisconsin, operate under policies that achieve cost and benefit goals, manage risks, and focus on retirement security. Many other states are adopting or weighing additional promising policies that could make costs more predictable without jeopardizing plan solvency or retirement security.

Several policies, particularly funding above the actuarial contribution, lowering return assumptions, establishing variable-benefit provisions, and using stress testing and risk analysis, stood out in Pew's analysis as effective tools to improve pension funding.

Funding above the actuarial contribution

States that follow the best practice of using actuarial recommendations to determine contributions typically contribute precisely the amount recommended and no more.³ But because the future is always uncertain, those recommended contributions may increase if investments fall short or something else goes wrong financially. Conversely, should markets or the overall economy outperform expectations, the recommended contributions could decrease.

One approach that states have taken to manage this uncertainty and cushion budgets from unexpected costs is to pay more into pension plans when they are flush with tax revenue or windfall investment returns. By increasing contributions on such occasions, states with underfunded plans can make additional progress in paying down pension debt while states with well-funded pension plans can build a cushion against a future market downturn.

In 2021, Connecticut found itself with a budget surplus and a fully funded rainy day fund.⁴ So, the state contributed a portion of the surplus to its pension plans, in accordance with a 2017 law that specified how extra revenue should be used. The supplemental contribution enabled Connecticut to pay down about \$1.6 billion in pension debt ahead of schedule.⁵ Arizona, California, Illinois, Indiana, New Jersey, and Tennessee have also employed similar funding strategies.⁶ States that fund their pension plans at levels above the actuarially recommended contributions can expect to save money because paying debt down faster is always cheaper in the long run.

Another potential advantage for states that make contributions that exceed minimum benchmarks is that doing so gives policymakers the flexibility to ratchet back their contributions without falling below those minimums. For example, California reduced scheduled supplemental pension contributions in 2020 because of the fiscal uncertainty and challenges that accompanied the COVID-19 pandemic but still made the full actuarially required contributions. Colorado and Oregon similarly were able to lower pension contributions during the pandemic without falling below minimum standards.⁷ These examples contrast with states' experiences during prior downturns, when many states reduced contributions below actuarial requirements.

Tennessee's reserve fund, discussed previously, takes this idea of funding above required contribution levels further than the practices of any other state by setting target contribution rates that exceed actuarial minimums and then putting the overage aside to stabilize future costs. The state uses the reserve fund to make up any short-term difference in actuarial contribution rates from a recession or dip in financial markets, while allowing employer costs to stay the same. This shows how contribution policy design is a key tool that states can use to reduce the budget risk posed by public pension plans.

Lowered return assumptions

Since 2015, 46 states have reduced the assumptions about future investment returns, also called "discount rates," that they use to estimate the long-term cost of pension benefits. Fourteen of those states lowered their assumptions from 2019 to 2020. When projecting costs, actuaries assume that assets invested today will grow over time to pay for future benefits, so the discount rate has a big influence on the ultimate bill that states must pay for retiree benefits. Lowering the return assumption means that plans' self-reported liabilities will increase, and the actuarially calculated contribution rate will grow. But employing more conservative, lower assumptions can protect plans against the investment shortfalls and the employer contribution increases that result when discount rates prove too ambitious.

The experiences of pension plans during the first two decades of this century provide a case study in the consequences of return assumptions that aim high and miss. After relatively rosy investment performance in the late '90s, the market crashes of 2000 and 2007 put strains on plan balance sheets, causing spikes in employer costs. Many states were unable to effectively manage those cost increases because they had relied on discount rates that assumed the persistence of high investment returns but were ultimately incorrect, leaving the states short on cash. As a result, plans that were fully funded in 2000 found themselves facing considerable funding challenges even though investment returns from 1995 through 2021 averaged over 8%. Optimistic assumptions about what financial markets could deliver led to similarly rosy assessments of pension plan funding levels, which in turn obscured the impact of economic downturns on pension sustainability and delayed policymaker action.

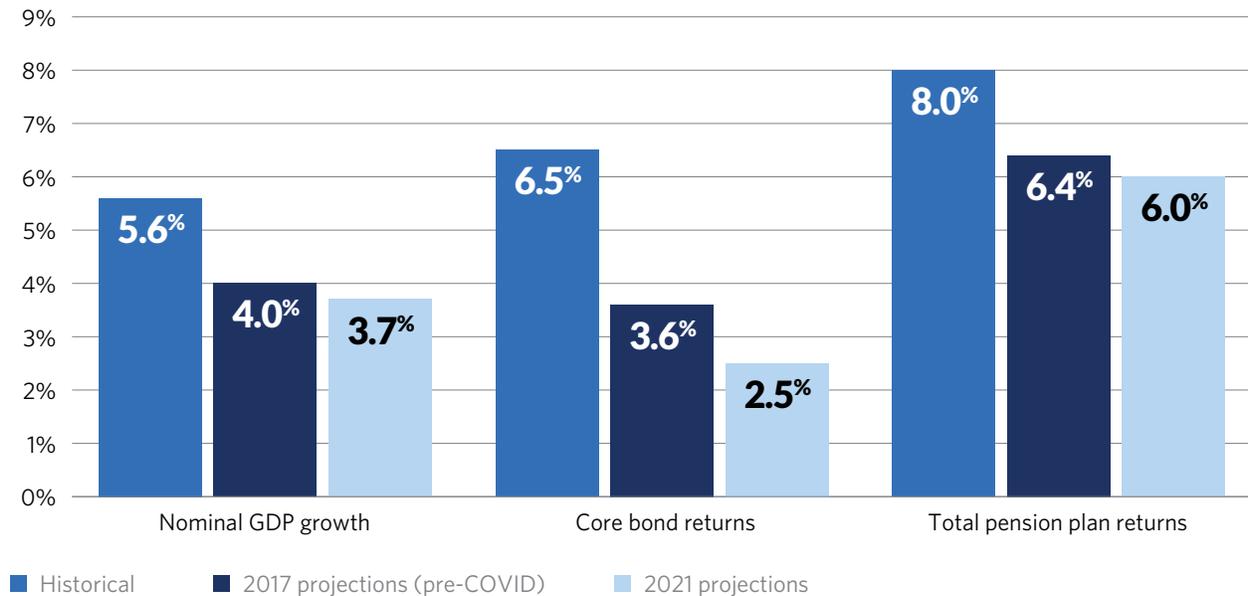
And economic conditions are once again weakening. As of this writing, projections suggest that in 2022 and for the foreseeable future, economic factors critical to investment performance, including growth in the gross domestic product (GDP) and bond yields, will be below not only historical averages but also pre-pandemic estimates. Similarly, forecasts indicate that a reasonable return assumption for the typical pension plan will be closer to 6% than to the median discount rate of 7.1% that plans used in 2020.

In light of this economic outlook, state plans should consider reductions to their discount rates. Although such changes will increase liabilities and actuarial cost calculations, they also will make plans more likely to hit their return targets and avoid the budgetary harm of a shortfall. Further, states could phase in the changes to spread the impact on balance sheets or costs out over time.

Figure 4

Projected Pension Fund Investment Returns, Other Economic Metrics Lag Behind Historical Averages and Pre-Pandemic Estimates

Average plan returns, GDP growth, and bond yields, before and after the emergence of COVID-19



Note: Historical total pension plan returns represent plans' median performance as reflected in the Wilshire Trust Universe Comparison Service database. Both the 2017 and 2021 projected total pension plan returns are estimates of investment performance based on pension plans' typical asset allocations. All projections use The Terry Group's capital market assumptions.

Sources: Barclay Aggregate Bond Index from January 1988 to December 2007; Wilshire Trust Universe Comparison Service (TUCS) database from July 1995 to June 2021; The Terry Group's capital market assumptions

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The California Public Employees' Retirement System takes an innovative approach to managing return assumptions. The state automatically reduces discount rates and shifts plan investments to lower-risk assets whenever returns are sufficiently strong to absorb the higher pension costs and potentially lower returns associated with such changes. The result is that the system will shift over time to employ more easily attainable investment targets than it used before and reduce its downside risk without unduly straining public budgets.⁸

Variable benefit provisions

In general, the purpose of COLAs is to protect retirees against inflation and help them maintain a consistent quality of life. But COLAs also represent a sizable portion of pension costs, so policymakers in many states have used COLA policies to stabilize troubled pension plan balance sheets.

As noted earlier, some states, such as Wisconsin and South Dakota, use adjustable COLAs that effectively share risk and gains between employers and retirees and have allowed those states' pension plans to maintain stable funding and costs despite volatile investment markets. However, the more common—and less effective—approach to COLA changes has come in the form of ad hoc benefit cuts. For instance, after the 2007 recession 17 states reduced or eliminated retiree COLAs, and another 15 did so for new hires or current employees.⁹ Although these changes reduced states' liability for retiree benefits, which in turn lowered their pension debt and the amount needed to fund benefits, they also can create confusion and financial distress for retirees.

In particular, many retirees who had thought their COLAs were guaranteed were caught off guard by the cuts and found themselves more vulnerable to inflation than they would have been had they received their full planned COLAs. Further, many states that implemented ad hoc cuts did not provide guidance to pension boards and lawmakers about whether, when, and how to restore COLAs when conditions improved.

In some cases, states are revisiting these decisions with one-time COLA increases in light of higher-than-expected inflation and windfall investment returns. For example, in 2017, the Ohio State Teachers Retirement System eliminated COLAs for retired teachers—a previous reduction of cost-of-living adjustments in 2013 had only affected teachers who had not yet retired—to address the system's growing pension debt and to compensate for employer contributions that were fixed below the actuarial minimum. Following strong 2021 investment performance that improved the plans' funding levels, Ohio teachers are getting a one-time COLA bump with the possibility of subsequent increases.¹⁰ Other states that have recently provided ad hoc or one-time COLAs include Oklahoma, Texas, and Washington.¹¹

One possible concern that policymakers should keep in mind when considering one-time COLAs or extending those already granted is whether a benefit increase that may seem affordable today would prove unaffordable in case of an unexpected fiscal stress. For instance, strong market performance in the late 1990s prompted benefit increases that created long-term fiscal challenges from California to Pennsylvania.¹² For these states, a variable COLA, similar to those used in South Dakota and Wisconsin, could have helped avoid the risks that simply reinstating a previously eliminated COLA, or a similar change, pose.

However, adjustable COLAs are not the only type of variable benefit provisions. For example, Wisconsin's variable contribution provision, described earlier, splits the total annual cost of the plan between employees and employers. Other states, including Arizona, Connecticut, Idaho, and Pennsylvania, use similar policies. In addition, as discussed previously, Tennessee employs a hybrid plan design that includes both a DB and a DC component to hedge against risk and ensure retirees receive at least a fixed minimum benefit. Oregon, Pennsylvania, Rhode Island, and Washington also use hybrid designs. Finally, Nebraska and Kentucky use a "cash balance" plan design in which workers' retirement savings grow faster when investments do well and slower when investments do poorly, so that all stakeholders share in the risk and gains of volatile investment markets.

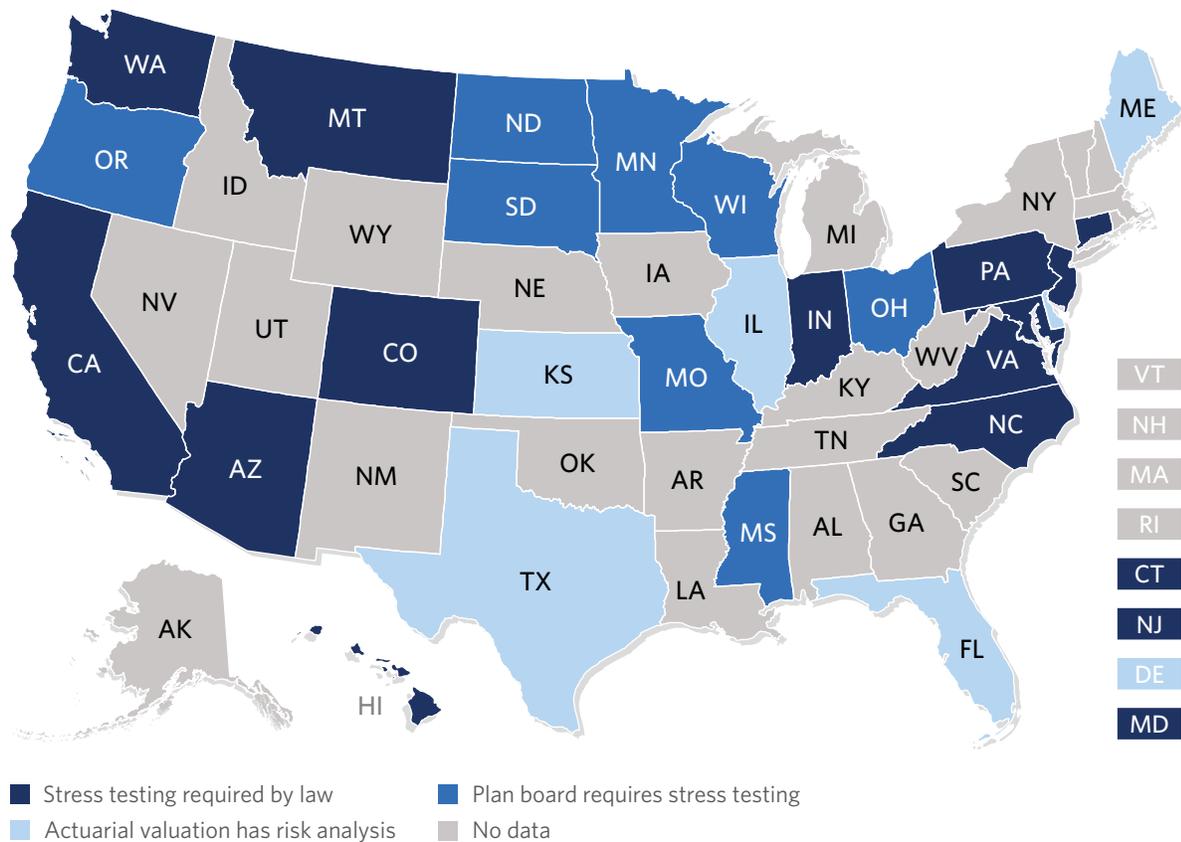
Stress testing and risk analysis

The future is always uncertain and even if long-term assumptions about economic growth, demographic trends, and financial market performance hold true in the aggregate, volatility will strain public pension plan balance sheets and employer budgets unless tools are in place to manage the risk. A positive and helpful trend in this regard is the increasing number of states using risk analysis and stress testing. By 2022, 27 states were conducting at least some level of risk analysis for their pension plans, up from just seven in 2012. Of the states following this best practice in 2020, 20 had a formal stress testing requirement in statute or through policies set by the plans' boards of trustees.

Figure 5

Most Public Pension Plans Conduct Some Risk Reporting; 20 Require It

Use of and mandates for stress testing and risk reporting by state, 2022



Source: Review of analysis and disclosures in actuarial valuations, standalone risk assessments, available board presentations, and other pension plan documents

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Stress testing helps states anticipate and take steps to address scenarios that might threaten their pension systems. For instance, stress testing has helped Colorado identify that its retirement system had a 1 in 4 chance of insolvency and take preventive action; confirmed for Philadelphia policymakers that recent reforms would stabilize costs for their system; and informed Connecticut's efforts to fix a risky contribution policy. New Jersey policymakers used stress testing to evaluate their pension funding policy during the COVID-19 pandemic and found that skipping previously planned contribution increases—an option they considered in the face of competing fiscal pressures—would threaten the sustainability of the state's pension plans. In light of that finding, they proceeded with the planned increase.

Conclusion

More than a decade of work by state policymakers to strengthen policies and demonstrate fiscal discipline enabled state pension plans in 2020 to collectively meet Pew's minimum contribution benchmark for the first time since 2001. This progress has put many pension plans on the cusp of long-term solvency and sustainability, and policymakers must remain committed to making the actuarially required contributions if they are to achieve that goal.

However, given economic uncertainty and financial market volatility, this window of opportunity may not be open for long. To seize the moment, states should adopt proven and promising practices that can hasten their progress toward full, sustainable funding.

Just as every state and pension system is different, multiple paths also can lead to success, as demonstrated by the varied and successful approaches taken by South Dakota, Tennessee, and Wisconsin. These states' systems exemplify the best practices that can improve funding, avoid excessive or volatile costs, and ensure that participants have a path to retirement security.

For example, applying budget surpluses toward the cost of future pension benefits could move plans closer to full funding and help prevent the need for contribution increases in the event of lower-than-expected investment returns. Alternatively, putting surpluses in a reserve fund could provide resources to offset any contribution volatility. Further, lowering return assumptions could help plans avoid funding shortfalls when investments underperform—as could allowing some flexibility in the level of benefits that are provided. Finally, using stress testing and risk analysis can help states anticipate and understand the factors that threaten pension balance sheets and state budgets.

States that act now to build on contribution gains made over the past 10 years will better equip their pension plans to weather economic downturns and move their retirements systems even closer to long-term funding sustainability.

Appendix A: Methodology

Pew collected data for more than 230 pension plans. Figures presented are drawn from public documents or were provided by plan officials. Other main data sources were annual financial reports produced by each state and pension plan, actuarial reports and valuations, and other state documents that disclose financial details about public employment retirement systems. The data collected included measures of actuarial funding, information on cash flows, and details on the underlying actuarial assumptions and methods.

Pew gave plan officials an opportunity to review the collected data and provide additional information. Their feedback was incorporated into the data presented in this brief.

Because of lags in the publication of actuarial valuations for many state pension plans, only partial 2021 data was available, and fiscal 2020 is the most recent year for which comprehensive data was available for all 50 states. Data for a subset of local governments participating in the California Public Employees' Retirement System was not available in aggregate and was not included in this analysis.

Each state retirement system uses different assumptions and methods in presenting its financial information, and Pew made no adjustments or changes to the presentation of aggregate state asset or liability data. Assumptions underlying each state's funding data include the assumed rate of return on investments and estimates of employees' life spans, retirement ages, salary growth, marriage rates, retention rates, and other demographic characteristics.

Although 2020 is the latest year for which comprehensive data reported by state pension plans is available, Pew did estimate long-term state pension funding using the reported data already collected, benefit payment growth trends, cost of new benefits, contributions, and actual returns. This combination of data supports estimates of how financial market performance will strengthen or weaken plan funding even in the absence of complete valuation data.

In addition to actuarial and financial data, Pew relies on plan valuations, financial reports, investment disclosures, benefit handbooks, experience studies, stress tests, and similar documentation to illuminate plan design provisions and other practices among both states with a track record of success and those that have had persistent pension funding challenges.

Appendix B: State data, 2020

In thousands

State	Assets (plan net position)	Liabilities (total pension liability)	Pension debt (net pension liability)	Funded ratio
Alabama	\$39,415,485	\$58,504,210	\$19,088,725	67%
Alaska	\$15,144,769	\$23,099,778	\$7,955,009	66%
Arizona	\$49,631,495	\$80,243,085	\$30,611,590	62%
Arkansas	\$27,697,282	\$36,793,781	\$9,096,499	75%
California	\$495,517,832	\$689,862,628	\$194,344,796	72%
Colorado	\$58,273,199	\$83,891,244	\$25,618,045	69%
Connecticut	\$31,771,171	\$74,589,227	\$42,818,056	43%
Delaware	\$10,842,554	\$12,728,100	\$1,885,546	85%
Florida	\$161,946,526	\$217,497,837	\$55,551,311	74%
Georgia	\$97,923,882	\$126,752,665	\$28,828,783	77%
Hawaii	\$17,385,480	\$32,691,756	\$15,306,275	53%
Idaho	\$17,902,700	\$20,097,794	\$2,195,094	89%
Illinois	\$92,306,663	\$246,152,776	\$153,846,113	37%
Indiana	\$31,060,611	\$44,983,169	\$13,922,558	69%
Iowa	\$34,883,750	\$42,068,738	\$7,184,987	83%
Kansas	\$20,606,874	\$31,080,439	\$10,473,565	66%
Kentucky	\$24,425,079	\$54,767,538	\$30,342,459	45%
Louisiana	\$35,375,377	\$55,935,763	\$20,560,386	63%
Maine	\$15,144,311	\$18,357,127	\$3,212,815	82%
Maryland	\$54,921,948	\$78,580,588	\$23,658,640	70%
Massachusetts	\$57,885,297	\$103,587,841	\$45,702,544	56%
Michigan	\$65,421,214	\$108,229,435	\$42,808,221	60%
Minnesota	\$71,190,792	\$88,259,260	\$17,068,468	81%
Mississippi	\$28,209,491	\$47,763,769	\$19,554,278	59%
Missouri	\$59,923,611	\$79,470,142	\$19,546,532	75%

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State	Assets (plan net position)	Liabilities (total pension liability)	Pension debt (net pension liability)	Funded ratio
Montana	\$11,797,640	\$17,540,706	\$5,743,066	67%
Nebraska	\$15,563,170	\$16,961,231	\$1,398,061	92%
Nevada	\$46,735,100	\$60,663,400	\$13,928,300	77%
New Hampshire	\$9,162,550	\$15,595,768	\$6,433,218	59%
New Jersey	\$79,866,563	\$208,173,146	\$128,306,583	38%
New Mexico	\$27,893,959	\$55,759,656	\$27,865,697	50%
New York	\$198,079,762	\$229,905,278	\$31,825,516	86%
North Carolina	\$103,188,555	\$118,983,168	\$15,794,613	87%
North Dakota	\$5,982,318	\$10,803,194	\$4,820,876	55%
Ohio	\$174,236,038	\$213,325,248	\$39,089,211	82%
Oklahoma	\$33,173,642	\$45,118,005	\$11,944,363	74%
Oregon	\$68,319,300	\$90,142,700	\$21,823,400	76%
Pennsylvania	\$93,584,786	\$160,049,802	\$66,465,016	58%
Rhode Island	\$6,554,728	\$12,088,024	\$5,533,296	54%
South Carolina	\$31,253,389	\$60,440,517	\$29,187,128	52%
South Dakota	\$12,297,338	\$12,292,995	-\$4,343	100%
Tennessee	\$41,911,533	\$42,737,539	\$826,006	98%
Texas	\$194,912,337	\$288,705,649	\$93,793,312	68%
Utah	\$38,996,379	\$40,379,797	\$1,383,418	97%
Vermont	\$4,650,609	\$7,965,898	\$3,315,289	58%
Virginia	\$79,358,073	\$106,651,176	\$27,293,103	74%
Washington	\$105,119,564	\$110,556,760	\$5,437,196	95%
West Virginia	\$15,859,438	\$19,636,591	\$3,777,153	81%
Wisconsin	\$124,966,394	\$118,723,255	-\$6,243,139	105%
Wyoming	\$9,643,389	\$12,264,363	\$2,620,974	79%
Total	\$3,147,913,946	\$4,531,452,555	\$1,383,538,610	69.5%

Note: All dollar figures are in thousands.

Sources: Comprehensive annual financial reports, actuarial reports and valuations, other public documents, or as provided by plan officials

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Appendix C: Net amortization benchmark

The benchmark is calculated by taking the sum of service cost (the actuarial value of the benefits earned in 2020, also called normal cost) and interest on the net pension liability at the beginning of the year (each pension plan's total pension liability and the net pension liability both grow annually at the plan's assumed rate of return) and subtracting employee contributions. Employer and employee contributions are adjusted to reflect expected interest. After subtracting the \$45 billion contributed by workers nationwide in 2020 (including interest), employers would have needed to contribute \$125 billion to meet the net amortization benchmark to keep pension debt from growing; contributions (plus interest) totaled \$130 billion, meaning that states as a whole had exceeded the minimum funding threshold for the first time in Pew's data since 2001.

Appendix D: Net amortization details, 2020

In thousands

State	Beginning of year net pension liability	Discount rate*	Assumed interest due on 2020 beginning of year debt	2020 normal cost [†]	2020 total expected cost [‡]	2020 employee contributions with interest	2020 employer contribution benchmark [§]	2020 actual employer contributions with interest	Percent of employer benchmark paid	Net amortization
Alabama	\$16,993,230	7.70%	\$1,308,479	\$1,016,931	\$2,325,410	\$819,989	\$1,505,345	\$1,810,654	120%	\$305,309
Alaska	\$7,376,268	7.38%	\$544,369	\$199,287	\$743,655	\$112,866	\$630,857	\$638,145	101%	\$7,289
Arizona	\$26,681,394	7.44%	\$1,985,096	\$1,837,937	\$3,823,033	\$1,519,922	\$2,294,859	\$2,521,173	110%	\$226,314
Arkansas	\$7,144,463	7.40%	\$528,690	\$561,978	\$1,090,669	\$243,997	\$846,764	\$827,658	98%	-\$19,107
California	\$185,059,392	7.10%	\$13,046,687	\$14,560,066	\$27,606,753	\$7,179,349	\$20,346,147	\$26,329,036	129%	\$5,982,888
Colorado	\$26,124,747	7.25%	\$1,894,044	\$1,199,156	\$3,093,200	\$1,049,849	\$2,043,351	\$1,917,636	94%	-\$125,715
Connecticut	\$40,125,228	6.90%	\$2,768,641	\$1,014,854	\$3,783,495	\$529,895	\$3,253,600	\$2,949,679	91%	-\$303,921
Delaware	\$2,028,526	7.00%	\$141,997	\$242,747	\$384,744	\$90,273	\$294,471	\$334,939	114%	\$40,468
Florida	\$45,626,666	6.72%	\$3,193,867	\$2,912,977	\$6,106,843	\$775,307	\$5,008,797	\$4,026,341	80%	-\$982,456
Georgia	\$25,912,283	7.24%	\$1,876,049	\$1,793,274	\$3,669,323	\$882,435	\$2,789,674	\$3,601,581	129%	\$811,907
Hawaii	\$14,169,421	7.00%	\$991,859	\$626,699	\$1,618,559	\$3,367	\$1,615,192	\$1,430,309	89%	-\$184,883
Idaho	\$1,017,414	7.05%	\$71,219	\$488,309	\$559,528	\$291,332	\$268,134	\$459,464	171%	\$191,330
Illinois	\$145,321,479	6.89%	\$10,012,650	\$3,496,660	\$13,509,310	\$1,617,345	\$11,886,037	\$9,597,651	81%	-\$2,288,386
Indiana	\$14,091,724	6.75%	\$951,191	\$626,282	\$1,577,473	\$68,245	\$1,509,229	\$2,053,093	136%	\$543,865
Iowa	\$5,963,275	7.00%	\$418,026	\$926,570	\$1,344,595	\$558,884	\$785,774	\$851,973	108%	\$66,199

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State	Beginning of year net pension liability	Discount rate*	Assumed interest due on 2020 beginning of year debt	2020 normal cost†	2020 total expected cost‡	2020 employee contributions with interest	2020 employer contribution benchmark§	2020 actual employer contributions with interest	Percent of employer benchmark paid	Net amortization
Kansas	\$8,900,634	7.75%	\$689,799	\$581,722	\$1,271,521	\$468,740	\$802,781	\$1,099,835	137%	\$297,054
Kentucky	\$29,742,516	6.74%	\$2,001,671	\$774,587	\$2,776,258	\$462,635	\$2,200,901	\$2,280,025	104%	\$79,124
Louisiana	\$18,179,754	7.45%	\$1,368,936	\$741,393	\$2,110,329	\$566,408	\$1,545,623	\$2,352,111	152%	\$806,489
Maine	\$2,808,820	6.75%	\$193,247	\$315,884	\$509,131	\$213,150	\$292,329	\$482,951	165%	\$190,622
Maryland	\$21,558,005	7.40%	\$1,595,292	\$1,464,630	\$3,059,922	\$885,976	\$2,174,412	\$2,267,022	104%	\$92,610
Massachusetts	\$39,848,224	7.25%	\$2,888,996	\$1,983,159	\$4,872,155	\$1,532,836	\$3,339,320	\$3,063,610	92%	-\$275,709
Michigan	\$41,413,250	7.06%	\$3,043,874	\$944,992	\$3,988,865	\$447,280	\$3,544,639	\$3,632,266	102%	\$87,627
Minnesota	\$15,309,362	7.49%	\$1,146,671	\$1,603,784	\$2,750,455	\$1,254,341	\$1,491,519	\$1,565,584	105%	\$74,065
Mississippi	\$17,771,205	7.75%	\$1,377,268	\$721,047	\$2,098,315	\$620,061	\$1,478,254	\$1,237,807	84%	-\$240,447
Missouri	\$17,099,660	7.35%	\$1,261,955	\$1,301,927	\$2,563,882	\$983,565	\$1,564,321	\$1,714,047	110%	\$149,726
Montana	\$4,501,786	7.60%	\$341,686	\$250,837	\$592,523	\$221,981	\$370,350	\$384,078	104%	\$13,727
Nebraska	\$1,123,154	7.50%	\$84,237	\$387,069	\$471,306	\$266,911	\$204,395	\$342,926	168%	\$138,531
Nevada	\$13,636,000	7.50%	\$1,022,700	\$1,207,300	\$2,230,000	\$1,134,491	\$1,095,509	\$1,083,583	99%	-\$11,927
New Hampshire	\$4,855,666	6.75%	\$327,757	\$314,686	\$642,443	\$238,190	\$404,222	\$466,972	116%	\$62,749
New Jersey	\$124,830,369	7.30%	\$9,112,617	\$3,968,235	\$13,080,852	\$2,305,755	\$10,774,954	\$6,267,957	58%	-\$4,506,997
New Mexico	\$14,199,014	7.10%	\$1,029,428	\$798,859	\$1,828,288	\$651,725	\$1,176,563	\$913,109	78%	-\$263,454
New York	\$8,762,368	6.83%	\$598,470	\$4,109,284	\$4,707,754	\$468,926	\$4,239,553	\$4,943,478	117%	\$703,925

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State	Beginning of year net pension liability	Discount rate*	Assumed interest due on 2020 beginning of year debt	2020 normal cost†	2020 total expected cost‡	2020 employee contributions with interest	2020 employer contribution benchmark§	2020 actual employer contributions with interest	Percent of employer benchmark paid	Net amortization
North Carolina	\$13,243,484	6.50%	\$927,044	\$2,721,306	\$3,648,350	\$1,457,849	\$2,191,142	\$2,849,033	130%	\$657,891
North Dakota	\$2,543,755	7.10%	\$196,632	\$218,666	\$415,298	\$175,125	\$241,612	\$201,451	83%	-\$40,161
Ohio	\$42,113,778	7.20%	\$3,082,729	\$3,209,088	\$6,291,817	\$3,212,107	\$3,084,682	\$3,954,868	128%	\$870,186
Oklahoma	\$7,919,781	6.97%	\$584,480	\$806,630	\$1,391,110	\$491,176	\$908,907	\$1,417,918	156%	\$509,012
Oregon	\$17,297,500	7.20%	\$1,245,420	\$1,187,200	\$2,432,620	\$10,561	\$2,422,059	\$2,380,326	98%	-\$41,734
Pennsylvania	\$64,960,608	7.17%	\$4,683,660	\$2,952,427	\$7,636,087	\$1,530,358	\$6,109,900	\$8,140,592	133%	\$2,030,693
Rhode Island	\$5,510,206	7.00%	\$385,163	\$156,965	\$542,129	\$97,813	\$444,112	\$490,539	110%	\$46,427
South Carolina	\$26,004,659	7.25%	\$1,885,338	\$1,184,242	\$3,069,580	\$1,118,023	\$1,952,711	\$2,118,597	108%	\$165,886
South Dakota	-\$10,597	6.50%	-\$689	\$237,265	\$236,576	\$135,750	\$100,826	\$135,894	135%	\$35,068
Tennessee	\$734,745	7.25%	\$53,269	\$653,902	\$707,171	\$296,283	\$410,888	\$864,081	210%	\$453,193
Texas	\$83,854,469	7.19%	\$6,129,762	\$7,607,032	\$13,736,794	\$4,628,476	\$9,137,754	\$4,805,062	53%	-\$4,332,692
Utah	\$3,197,501	6.95%	\$222,226	\$695,603	\$917,829	\$41,100	\$876,729	\$1,312,849	150%	\$436,120
Vermont	\$2,575,458	7.00%	\$193,159	\$128,481	\$321,640	\$106,038	\$215,602	\$233,656	108%	\$18,054
Virginia	\$23,554,781	6.75%	\$1,589,948	\$2,039,504	\$3,629,452	\$947,403	\$2,682,049	\$2,648,078	99%	-\$33,970
Washington	\$3,839,038	7.40%	\$287,160	\$2,300,898	\$2,588,058	\$1,323,282	\$1,265,314	\$3,365,284	266%	\$2,099,970
West Virginia	\$3,177,690	7.50%	\$238,327	\$284,486	\$522,813	\$183,385	\$339,428	\$661,448	195%	\$322,020
Wisconsin	-\$3,224,457	7.00%	-\$225,712	\$1,975,773	\$1,750,061	\$1,089,483	\$660,579	\$1,172,311	177%	\$511,732

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State	Beginning of year net pension liability	Discount rate*	Assumed interest due on 2020 beginning of year debt	2020 normal cost†	2020 total expected cost‡	2020 employee contributions with interest	2020 employer contribution benchmark§	2020 actual employer contributions with interest	Percent of employer benchmark paid	Net amortization
Wyoming	\$2,770,407	7.00%	\$193,928	\$236,920	\$430,849	\$196,025	\$234,824	\$202,085	86%	-\$32,739
Total	\$1,248,238,102		\$89,489,312	\$81,569,510	\$171,058,822	\$45,506,261	\$125,056,995	\$130,400,767	104%	\$5,343,772

* We weight the assumed rate of return for each plan in a state by the plan's share of the state's unfunded liability at the start of 2020 to calculate the effective discount rate for this calculation.

† "Normal cost" refers to the cost of benefits earned by employees in any given year. Also called the "service cost."

‡ "Total expected cost" represents the projected increase in the funding gap before accounting for employer and employee contributions. It is equal to the normal cost plus the assumed interest on the unfunded liability.

§ "Employer contribution benchmark" is the amount employers need to contribute to keep pension debt from growing.

|| Positive numbers indicate expected pension debt decreases, and negative numbers indicate expected pension debt growth.

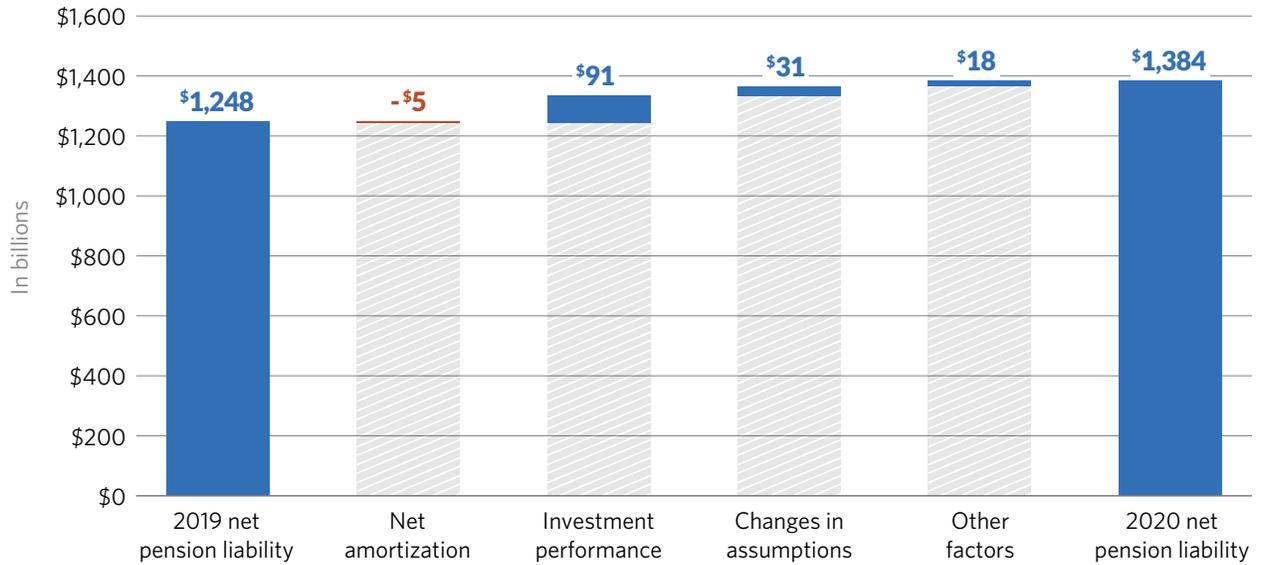
Notes: All dollar figures are in thousands. Interest on pension debt is calculated at the plan level and aggregated up. Because of weighting, multiplying the state discount rate by the state net pension liability at the beginning of the year does not always give the precise value for the interest on the debt. Numbers may not be exact due to rounding.

Sources: Comprehensive annual financial reports, actuarial reports and valuations, other public documents, or as provided by plan officials

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Appendix E: Debt drivers

Investment Performance and Assumption Changes Led to Increased Pension Debt in 2020



Sources: Comprehensive annual financial reports, actuarial reports and valuations, other public documents, or as provided by plan officials

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Endnotes

- 1 For a summary of Pennsylvania's key changes and their fiscal impact, see: G. Mennis, "Pennsylvania's Historic Pension Reforms," The Pew Charitable Trusts, Dec. 14, 2017, <https://www.pewtrusts.org/en/research-and-analysis/articles/2017/12/14/pennsylvanias-historic-pension-reforms>. Also, see the state's official actuarial analysis: Independent Fiscal Office, "Actuarial Note Transmittal: Amendments 01354 and 01558 to Senate Bill 1, Printer's Number 853" (Independent Fiscal Office, 2017), http://www.ifo.state.pa.us/download.cfm?file=Resources/Documents/ACN_SB1_A01354_A01558_2017_06_03a.pdf.
- 2 Based on 2020 data, the 10 best-funded states were Delaware, Idaho, Nebraska, New York, North Carolina, South Dakota, Tennessee, Utah, Washington, and Wisconsin, and the 10 worst-funded were Connecticut, Hawaii, Illinois, Kentucky, Massachusetts, New Jersey, New Mexico, North Dakota, Rhode Island, and South Carolina.
- 3 The actuarially determined employer contribution (ADEC) is the amount that plan actuaries calculate would be adequate to pay for the cost of benefits earned in a given year plus any accumulated shortfall between assets and liabilities. The ADEC depends on the actuarial assumptions used, in particular the assumed rate of return on plan investments, as well as the policy regarding how quickly to pay down unfunded liabilities.
- 4 Rainy day funds are a tool that states use to manage revenue volatility. States put money aside in these funds to pay for important spending priorities in the event tax revenue falls short of targets because of a recession or economic crisis. See The Pew Charitable Trusts, "Rainy Day Funds: Best Practices to Mitigate Revenue Volatility" (2021), <https://www.pewtrusts.org/en/research-and-analysis/articles/2017/06/rainy-day-funds-best-practices-to-mitigate-revenue-volatility>.
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- 7 See: Kansas Senate Bill 421; H. Borrud, "Special Session of Oregon Legislature Wraps up Late Monday After Tension-Marked Single-Day Session," *OregonLive*, Aug. 10, 2020, <https://www.oregonlive.com/news/2020/08/tension-marked-special-session-of-oregon-legislature-spills-into-second-day.html>; J. Collins, "SC Legislature OKs Delaying Budget; Plans Big Sept. Return," *U.S. News & World Report*, May 12, 2020, <https://www.usnews.com/news/best-states/south-carolina/articles/2020-05-12/south-carolina-lawmakers-meet-tuesday-but-for-how-long>; R. Kozlowski, "Moody's Dings Colorado for Dropping \$225 Million Pension Contribution from Budget," *Pensions & Investments*, July 28, 2020, <https://www.pionline.com/pension-funds/moodys-dings-colorado-dropping-225-million-pension-contribution-budget>; Office of Governor Gavin Newsom, "Governor Newsom Signs 2020 Budget Act"; S. Min, "Oklahoma Lawmakers Squelch Veto on Siphoning Pension Money," *Chief Investment Officer*, May 15, 2020, <https://www.ai-cio.com/news/oklahoma-lawmakers-squelch-veto-siphoning-pension-money/>; The Department of Finance, "California State Budget 2021-22."
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- 11 See: Oklahoma House Bill 3350, Oklahoma State Legislature (2020), <http://www.oklegislature.gov/BillInfo.aspx?Bill=HB3350&Session=2000>; New Mexico Senate Bill 72, New Mexico Legislature (2020), <https://www.nmlegis.gov/Legislation/Legislation?Chamber=S&LegType=B&LegNo=72&year=20>; Texas Senate Bill 7, Texas Legislature (2021), <https://capitol.texas.gov/BillLookup/History.aspx?LegSess=872&Bill=SB7>; South Dakota House Bill 1032, South Dakota Legislature (2021), <https://mylrc.sdlegislature.gov/api/Documents/216973.pdf>; Alabama Act 2022-178 (2022), http://alisondb.legislature.state.al.us/Alison/SESSBillStatusResult.aspx?BILL=SB30&WIN_TYPE=SELECTED_STATUS; Alabama Act 2022-229 (2022), http://alisondb.legislature.state.al.us/Alison/SESSBillStatusResult.aspx?BILL=SB111&WIN_TYPE=SELECTED_STATUS; Arkansas Act 366 (2021), <https://www.arkleg.state.ar.us/Bills/Detail?ddBienniumSession=2021%2F2021R&measureno=HB1347>; North Carolina Session Law 2021-180 (2021), <https://www.ncleg.gov/Sessions/2021/Bills/Senate/PDF/S105v8.pdf>; New Hampshire Chapter 340 (2019), https://www.gencourt.state.nh.us/bill_status/legacy/bs2016/billText.aspx?sy=2019&id=655&txtFormat=html; Louisiana Act 37 (2021), <http://www.legis.la.gov/Legis/ViewDocument.aspx?d=1230684>; Vermont Act 114 (2022), <https://legislature.vermont.gov/bill/status/2022/S.286>; Washington Chapter 52, 2022 Laws (2022), <https://app.leg.wa.gov/billsummary?BillNumber=5676&Year=2021>; Delaware Volume 83, Chapter 54 (2021), <https://legis.delaware.gov/BillDetail?LegislationId=78941>; Connecticut Act 21-178 (2021), https://www.cga.ct.gov/asp/cgabillstatus/cgabillstatus.asp?selBillType=Bill&bill_num=SB1081&which_year=2021; Indiana Public Law 165 (2021), <http://iga.in.gov/legislative/2021/bills/house/1001#document-dbc2cc8e>.
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