

# SACRS

STATE ASSOCIATION *of* COUNTY RETIREMENT SYSTEMS

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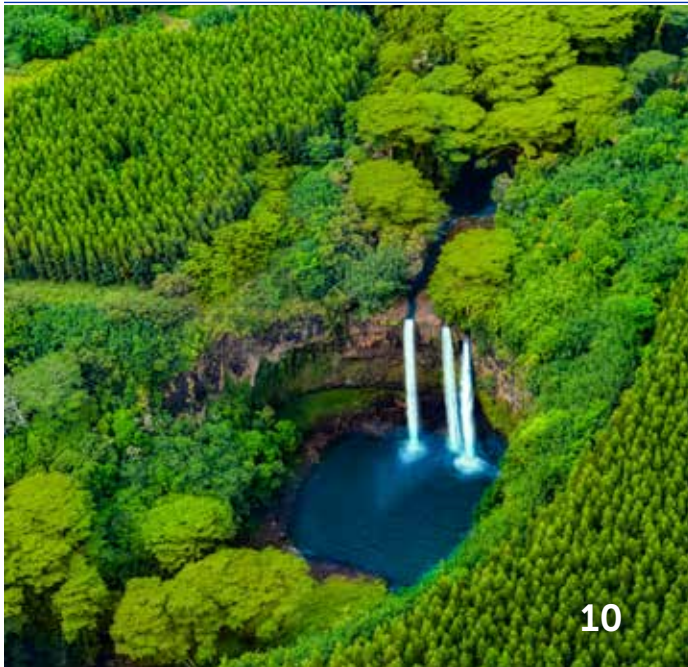


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<p>840 Richards Boulevard Sacramento, California 95811 T: (916) 701-5158</p> <p>SACRS.ORG</p>	<p>Vivian Gray, <i>President</i> David MacDonald, <i>Vice President</i> Adele Tagaloa, <i>Secretary</i> Jordan Kaufman, <i>Treasurer</i> Dan McAllister, <i>Immediate Past President</i> David Gilmore, <i>Board Member</i> Vere Williams, <i>Board Member</i> JoAnne Svendsgaard, <i>Affiliate Chair</i></p>	<p>Steve Delaney, <i>Audit Committee</i> Barbara Hannah, <i>Bylaws Committee</i> David MacDonald, <i>Program Committee</i> Dan McAllister, <i>Nominating Committee</i> JoAnne Svendsgaard, <i>Affiliate Committee</i> J.J. Popowich, <i>Education Committee</i> Eric Stern and Dave Nelsen, <i>Legislative Committee Co-Chairs</i></p>



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# IT'S BOARD ELECTION TIME!

“I so appreciate all our Board members' dedication to making SACRS the great organization that it is.”

It's hard to believe it is already time for board elections. (Didn't we just do this?) The SACRS Nominating Committee is pleased to present its suggested slate and final ballot for the SACRS Board of Directors 2023-2024. Elections for the SACRS Board of Directors is always held as part of the SACRS Spring Conference during the scheduled business meeting that typically takes place on the last day of the conference. The newly elected Directors will immediately assume their duties at the conclusion of the May 12 business meeting in San Diego, with the exception of the office of Treasurer. The incumbent Treasurer will co-serve with the newly elected Treasurer through the completion of the current fiscal year.

Here is the SACRS Nominating Committee Recommended Slate

**President**-David MacDonald Contra Costa CERA

**Vice President**-Adele Tagaloa, Orange CERS

**Treasurer**-Jordan Kaufman, Kern CERA

**Secretary**-Zandra Cholmondeley, Santa Barbara CERS

**Regular Member**-David Gilmore, San Diego CERA

**Regular Member**-Vacant

This time is always a bit bittersweet for me. While I'm always excited to work with the newly elected board, it also means saying goodbye to or adjusting to changing roles for some individuals.

With the new Board, Dan McAllister, Immediate Past President of SACRS and SDCERA Trustee, completes his term. Dan had a vision for SACRS to become a world-class organization and to elevate our programs, our bylaws, our communications, and the conference experience for members. His efforts leave a lasting impression on our Association. It is my honor to have worked with him and I know you will join me in thanking him for all he has accomplished.

While she will stay on the Board in a new capacity, as Immediate Past President, it's been a great experience working with

Vivian Gray. Please join me in thanking Vivian for her service as our President, for her collaborative style and inclusive perspectives. I so appreciate all our Board members' dedication to making SACRS the great organization that it is.

## SAVE THE DATE

Even as we put the finishing touches on the Spring Conference, we are thinking about our Fall Conference 2023 that will be here before we know it. Do you have the dates November 7-10 saved on your calendar? This year we return to the beautiful *Omni Rancho Las Palmas Resort & Spa in Rancho Mirage, CA*. If you have ideas for sessions, please let me know and keep an eye out over the summer as more details about the conference are published.

I hope your year is going well and If you attend one of our wonderful events, be sure to stop me and say "Hello"!

My best to all,

*Sulema H. Peterson*

**Sulema H. Peterson**, SACRS Executive Director, State Association of County Retirement Systems



**SACRS**  
**SPRING CONFERENCE 2023**  
**WEDNESDAY, MAY 10**

SUNSET PAVILION/SUNSET TERRACE | 6:30PM – 9:30PM

**Ahoy!**

It's all hands on deck for some prime networking time as the much-anticipated **SACRS ANNUAL WEDNESDAY NIGHT EVENT** takes on a nautical flare. It's the perfect opportunity to review the day together, exchange ideas, meet new friends and catch up with colleagues.

You'll never feel like a castaway at this SACRS event that includes a reception, dinner, and live music in the festive tropical setting of Paradise Point & Spa, San Diego's Island Resort.

This is an indoor/outdoor event near the bay with cooler temperatures at night. Resort Casual attire is appropriate, warm layers for the evening is suggested.



# A Farewell MESSAGE



“It has been an honor to serve as your President.”

In the last four years, we at SACRS have endured so much—the pandemic upending our lives; our approach to work and the need for balance in our everyday living—from working at home or other places outside of California and returning fewer days to the office or board rooms. Teleconferencing has become a normal part of our lives. And webinars a means of education and connection.

Today, we face challenges of market instability, the failure of some banks, rising interest rates, and predictions of a looming recession. There's a need in our system investments for risk adjustments and possibly reallocation of our assets. Our fiduciary duties are in full force as we make decisions to protect our members' secure retirement and our fund's assets. The knowledge, expertise, and insight we need to fulfill our duties are often provided by attending SACRS' conferences and educational programs, like our UC Berkeley Program *Modern Investment Theory and Practice for Retirement System*. At SACRS there is always an exchange of ideas, information, education, and networking.

I encourage everyone to take advantage of all that SACRS has to offer! Coming in 2024 SACRS will mark 70 years of “Providing Insight and Fostering Oversight” through educating our system's trustees and SACRS members who work tirelessly in every

capacity to ensure California's Public Employees' retirement security.

SACRS Spring Conferences always mark a time for the “changing of the guard” so to speak. At the business meeting during Spring Conference 2023 in Paradise Point, San Diego, the slate for the board of directors from SACRS Nominating Committee will be presented for the systems' vote. To that end, I welcome our new board members and I bid the Membership farewell – it has been an honor to serve as your President.

Although I will remain as SACRS' Immediate Past President, I look forward to supporting the new board in their endeavors. SACRS will always have the foundational goal to “remain relevant and sustainable” no matter the challenges the organization and its members may face. Without the input of its past leaders SACRS would not be able to boast a history of 70 years. I hope to be one of the past leaders who can offer our new leadership insight into the past with an eye toward moving into the future.

Humbly yours,

*Vivian*

**Vivian Gray**, President of SACRS & LACERA Trustee



# Continuation Solutions Offer **LIQUIDITY** and **OPPORTUNITY** In Volatile Markets

## AUTHOR'S NOTE:

Continuation solutions encompass a host of transaction types in which a GP secures interim liquidity and/or additional primary capital for their LPs in a strongly performing asset, or set of assets, that the GP will continue to own and control. Specifically, they include continuation funds, new funds created by GPs for the purpose of acquiring the asset(s) that continue to be managed by the same GP and capitalized by one or several secondary buyers, or equity recapitalizations involving a direct equity or structured equity investment into a portfolio company. These transactions can also include a parallel investment from the GP's latest fund into that same pool of assets (a "cross-fund trade").





Nonetheless, in the current environment, GPs face increasingly louder calls to provide liquidity to their Limited Partners (LPs), who are contending with overallocated private equity portfolios (due to the “denominator effect”) and a perpetually crowded fundraising environment with shorter fund cycles.

In this article, we examine how continuation solutions are solving this liquidity mismatch and emerging as a market-agnostic tool for the benefit of both sponsors and their LPs, while creating attractive investment opportunities for new investors.

## Traditional paths to liquidity for private equity exits dried up

2022 market conditions created a draconian reduction in the traditional liquidity pathways for GPs across the board, with Pitchbook data showing \$620 billion of exits representing a 34% decrease compared to 2021. On a regional basis, the reduction in exits was most pronounced in the Americas, where sponsor-backed exits declined by 42%. Liquidity in EMEA was similarly affected (33% decrease) while Asia was relatively insulated (8% increase). The initial public offering market suffered the most acute reduction in liquidity for sponsor-backed listings, with volumes down 73% and the IPO window effectively closed to all but the most robust companies. The M&A market offered a relatively better exit pathway, but one that was challenged nonetheless, with sales to strategic and financial buyers down 25% in aggregate.<sup>4</sup>

### Global PE – Private Equity Backed Exits



Source: Pitchbook, data as of 12/31/22

Private equity sponsors are increasingly turning to continuation solutions as traditional pathways to liquidity remain challenged in the current market environment. While this dynamic has created a compelling entry point for new investors to gain exposure to top quality assets, what happens if (or when) markets improve?

The perfect storm of rapidly rising interest rates, entrenched inflation, and geopolitical instability, which caused significant capital market constriction over the course of 2022, has been widely discussed. Perhaps less broadly appreciated is the magnitude and extent to which broader macro volatility has reduced the ability of private market general partners (GPs) to raise liquidity through customary channels.

As these traditional paths to liquidity have become more constrained, the need for GPs to return capital to LPs and attend to their track records has remained unchanged. Because GPs are also looking to raise capital in what has become an increasingly crowded fundraising environment, many are proactively seeking liquidity from alternative sources. In growing numbers, GPs are finding that liquidity through what we define as *continuation solutions*, in the form of multi-asset GP-led secondaries, single asset deals, or other investment structures, such as equity recapitalizations or cross-fund trades.

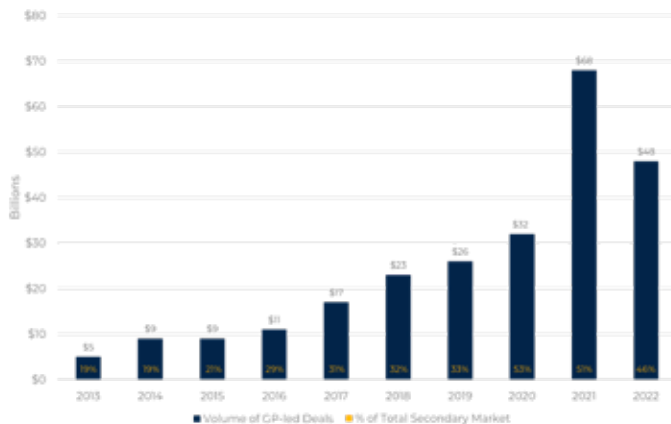
“Existing LPs who elect to sell into a continuation solution often do so out of the desire or need for liquidity or insufficient in-house resources to underwrite the transaction in a limited amount of time.”

## Liquidity challenges boost interest in continuation solutions

Many of the GP-led transactions in the secondary market take the form of continuation funds (and are therefore frequently used as a proxy for the broader spectrum of continuation solutions). At a functional level, these transactions provide LPs with the option, but not the obligation, to take liquidity from the sale of a single company - or multiple portfolio companies - to a continuation fund that continues to be managed by the existing GP, or to maintain their exposure to that asset by rolling their capital into the newly formed continuation vehicle.

A recent Evercore survey found that the volume of GP-led secondary deals has boomed in the last few years, reaching an all-time high of \$68 billion in 2021, accounting for 51% of the overall secondary market. Despite the significant constraints in traditional exits in 2022, GP-led secondary volume remained strong at \$48 billion and 46% of total secondary volume, the third highest share of the overall secondary market in the last decade.

### Historical GP-led Transaction Volume



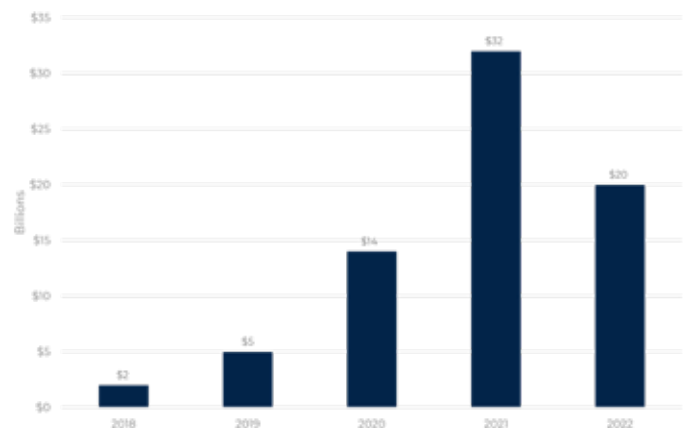
Source: Evercore Secondary Market Survey, February 2023

Recent history has also seen an exponential growth in the more concentrated continuation funds. In particular, there has been a notable increase in single asset secondaries in which GPs exercise positive selection bias to pick their individual trophy assets, not only providing liquidity to their LPs but also continuing to back their high quality companies. In 2022, single asset continuation funds accounted for \$20 billion of transaction volume, or 42% of all GP-led transactions, and represented 19% of the secondary market overall. While this marks a 5% decrease from 2021, and an uptick of traditional LP deals from prior years, the trend toward single asset GP-leds remains firmly entrenched, growing meaningfully from 2018 when single asset deals represented only 3% of the total secondaries market.<sup>2</sup>

## Attractive entry point for new LPs

While much of the foregoing has centered on the benefits for GPs and existing LPs, continuation transactions also represent an attractive entry point for investors to access top quality private equity-backed assets with positive selection bias and lower risk, especially in a volatile market environment. New investors benefit from the GP's familiarity with their portfolio companies, with GPs often earmarking the assets in which they wish to retain exposure for the continuation vehicle, including those assets that have some of the strongest prospects for further value creation. Existing LPs who elect to sell into a continuation solution often do so out of the desire or need for liquidity or insufficient in-house resources to underwrite the transaction in a limited amount of time. These selling LPs create a meaningful opportunity for new investors to access companies that have been calibrated by the existing sponsor, benefiting from the ongoing ownership and governance by these same sponsors, without the new investment risk that comes with a change of control.

### Single Asset Deal Volume



Source: Evercore Secondary Market Survey, February 2023





“Continuation solutions provide a flexible alternative whereby GPs can continue creating value in the asset(s) until more favorable exit markets return, while at the same time offering the option of liquidity to their LPs.”

To quantify the opportunity, single asset secondary transaction volume shows a tenfold increase in the last five years, suggesting that participation in continuation solutions is increasingly necessary for LPs to gain exposure to these trophy assets. Another benefit of these transactions worth considering is that the existing debt structure can also remain in place in certain circumstances, providing a potentially significant additional benefit to the incoming investor, particularly in the current environment of higher interest rates and dislocated syndicated credit markets.

## Continuation solutions as an all-weather liquidity tool

In stronger economic environments, traditional exit paths such as M&A or IPOs are both attractive and available to GPs looking to generate liquidity and raise capital for their portfolio companies. Yet, sponsors leaned into continuation solutions throughout the robust market environment of 2021. Rather than selling their stronger performing assets to competing private equity funds, trade buyers, or public investors, continuation solutions enabled GPs and LPs to continue the journey and participate in the additional value creation of these strong performers, while also providing either partial liquidity to LPs (equity recaps) or optionality for liquidity (continuation funds) for investors who want it.

In contrast, during weaker economic environments like 2022, GPs are often reluctant to sell portfolio companies given that bids for assets tend to fall as volatility rises. Similarly, credit often becomes less available or more expensive for potential buyers, and both of these factors tend to diminish the appeal of selling assets at potentially less attractive terms. Continuation solutions provide a flexible alternative whereby GPs can continue creating value in the asset(s) until more favorable exit markets return, while at the same time offering the option of liquidity to their LPs.

Today's investors, uncertain of what lies ahead, may find the structure-agnostic capability of continuation solutions provides a flexible source of capital to GPs and LPs at a time when other financing avenues may be constrained. Looking forward, a trend to watch will be the performance of continuation solutions in a potentially recessionary environment. Due to the calibrated nature of these

deals, as well as the ongoing ownership and governance by the existing GPs, our expectation is that these transactions, while not immune to market conditions, have the potential to generate differentiated risk-adjusted returns relative to the broader public and private markets. Furthermore, for new investors, what was a seller's market at the outset of 2022 has tipped substantively more to the buyer's advantage in 2023 – bringing an opportunistic entry point with the potential for meaningful returns.

For these reasons, we believe that continuation solutions have the potential to generate attractive private equity returns with lower risk than that of the broader private equity buyout universe. While these types of investments can be appealing to investors in any market environment, the current macro and geopolitical uncertainty make them particularly compelling at this moment in time.

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### INDEX

- 1 Pitchbook, data as of 12/31/22
- 2 Evercore 2022 Secondary Market Survey, February 2023



**Valérie Handal** is managing director for HarbourVest London and focuses on secondary investments, primarily in Europe. She joined HarbourVest in 2006 and has played a lead role in a range of transactions, including multiple GP-led deals. Valérie currently serves on the advisory boards of funds managed by Astorg, Deutsche Telekom Capital Partners, Mandarin Capital and PAI Partners among others.



Principal at HarbourVest Partners, **Lenny Li**, CFA, joined the Firm in 2013 and focuses on sourcing, reviewing, executing, and monitoring direct co-investments. Lenny serves as a board observer on Knowlton Development Corporation and Horizon Telcom. He has also been involved with several of the Firm's other investments including Information Resources, Neighborly (The Dwyer Group) and Investment Metrics.



Principal **Nathan Ritsko** joined the HarbourVest team in 2022 as a product specialist focused on continuation solutions and works closely with the secondary, direct, and investor relations teams.





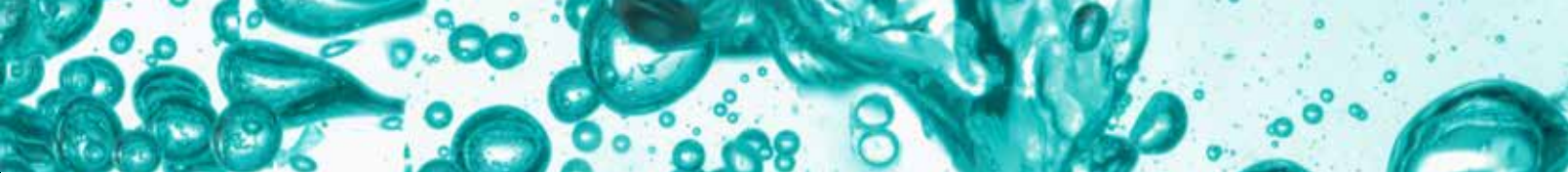
# WATER QUALITY: A CRITICAL PILLAR OF BIODIVERSITY

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*Solutions to the interrelated challenges of water quality  
and biodiversity loss*

Water quality and the state of biodiversity are intimately connected. Nature depends on clean water and, less obviously perhaps, clean water depends on nature.





**P**oor water quality contributes to direct drivers of global biodiversity loss, particularly in the form of pollution and invasive non-native species. It also impacts human health as highlighted in the UK and the US, for instance, by recent sewage leaks and lead pipe contaminations.

The spotlight is also increasingly turning to the profound effects of water pollution on nature. The toxic effects of pollutants like arsenic and mercury on wildlife and humans alike have long been understood. Awareness of other emerging pollutants, such as PFAS (known as ‘forever chemicals’), is rising. Studies have linked exposure to certain levels of PFAS, which are used in a range of consumer goods and clothing, to long-term human health problems including cancer, liver disease and fertility issues. These man-made substances have been found in hundreds of animal species.<sup>1</sup>

Improving water quality has historically proven difficult, even in developed countries. In this article, we discuss how water quality issues that harm natural capital can be mitigated at stages throughout the water cycle, with a tightening regulatory environment supporting innovative approaches and technologies.

*“Despite growing recognition of biodiversity’s critical importance to global society, including in efforts to address climate change, water impacts on nature are systematically underestimated.”*

### The nexus of water quality and biodiversity

As a report by Impax and Swedish pension fund AP7 highlighted in 2021, there are few standards or globally agreed frameworks to define water quality and pollution. This results in an absence of measurement and reporting. There has been much more focus on water availability, which is easier to both measure and address.

Despite growing recognition of biodiversity’s critical importance to global society, including in efforts to address climate change, water impacts on nature are systematically underestimated. Yet illustrations of the interdependence of biodiversity and water quality are evident throughout the water cycle.

**330+**  
species at risk of harm from exposure to PFAS ‘forever chemicals’

Source: Environmental Working Group, 2023

*“In some parts of the world, ‘dead zones’ have too little oxygen for marine life to survive. In the US and elsewhere, algal blooms have killed dolphins and other sea life.”*

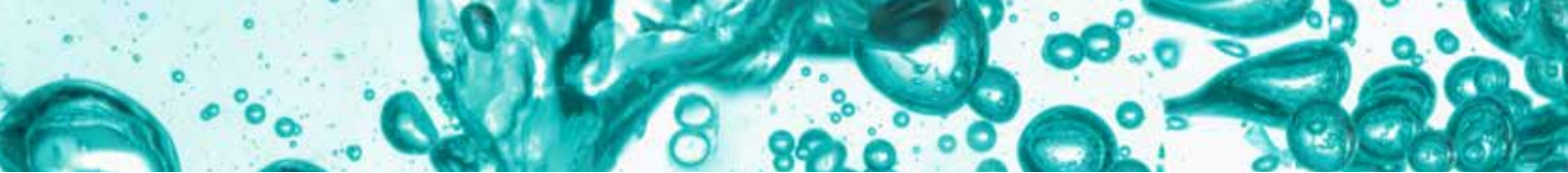
One of the clearest examples of biodiversity risks posed by water pollution is eutrophication, the process whereby high levels of nitrogen and phosphorus accumulate and feed algal blooms that suffocate aquatic life. Excess nutrients get into the water system from the over-use of fertilizers in agriculture. In some parts of the world, ‘dead zones’ have too little oxygen for marine life to survive. In the US and elsewhere, algal blooms have killed dolphins and other sea life.<sup>2</sup>

Like other water quality issues, the human drivers of eutrophication are challenging to address. We are encouraged, though, as interventions and innovations to improve the health of crucial ecosystems show great promise.

*“Industrial processes like making semiconductors can be highly water intensive, requiring high levels of extraction that can place pressure on local ecosystems.”*

### Opportunities to address water quality issues

We believe companies that improve water quality, either in their operations or through their products, can not only add value to the natural environment, but also tap into sizeable market opportunities. We conceptualize them as ‘upstream’, ‘midstream’ and ‘downstream’ solutions.



“More detailed water reporting would help investors better identify and assess risks facing companies.”

Upstream: Water companies that invest in protecting their catchment areas deliver what we term 'upstream' solutions. By working with farmers and landowners, utilities like Severn Trent can reduce agricultural and other runoff from entering rivers. Others have bought forests that surround reservoirs, protecting watersheds and supporting natural habitats. These interventions can save utilities - and their customers - money compared to grey infrastructure like treatment plants.<sup>3</sup>

Increasingly sophisticated products can prevent contaminated water from entering watercourses, ranging from pipe caps and filters to mini treatment systems with space-saving spiraled filters. U.S. company Advanced Drainage is one of the leaders in solutions for managing stormwater and preventing it from flooding into local ecosystems untreated.

Midstream: 'Midstream' solutions are those that assess water quality and improve usage. Sampling and monitoring are critical to understanding the scale of issues including the presence of PFAS in water courses. US company Agilent is one of the leading providers of testing and reporting solutions for PFAS and other pollutants.

Industrial processes like making semiconductors can be highly water intensive, requiring high levels of extraction that can place pressure on local ecosystems. Solutions that enable producers to shift from linear to circular water consumption can therefore help avoid negative environmental impacts. Chipmaker TSMC addressed the recent drought in Taiwan by building a plant that treats and reuses industrial water, for instance.<sup>4</sup>

Downstream: 'Downstream' solutions treat water to make it usable for drinking, bathing or discharge back into the natural environment. Water filters screen dirt and sediment, while reverse osmosis uses a membrane that can also remove dissolved chemicals and salts.

Emerging new technologies also include photocatalytics, which use light to remove contaminants. This has been applied in the shipping sector to help protect marine ecosystems from the threats posed by invasive non-native species which travel all over the world in ballast tanks. Swedish company Alfa Laval's chemical-free treatment technology uses UV light to ensure no microorganisms are unintentionally released into one habitat from another.

Regulatory focus should boost solutions

There is growing recognition among governments that the current rate of biodiversity loss is unsustainable and nothing less than a global emergency. Though there is much work to be done in implementing commitments, we were very pleased to see new commitments at the COP15 biodiversity summit in December 2022.

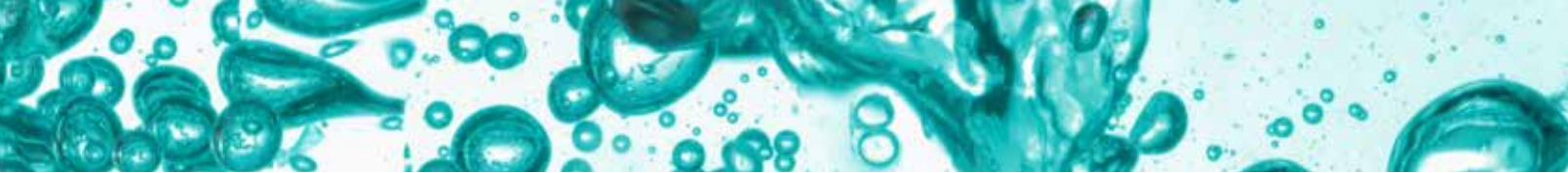
Water too has been in greater international focus, with an historic international agreement on ocean protection reached in early March. Under the High Seas Treaty, protection areas will extend to 30% of international waters by 2030. Marine life will be supported by limits on fishing, shipping and mining activities. Meanwhile, the first UN conference on freshwater in 50 years was held in March and focused on fast-tracking water action.

Several major economies are implementing rules that aim to improve water quality. The European Water Framework proposes heavier restrictions on sewage and limits on agricultural runoff to address eutrophication. As a result, the Baltic Sea, home to seven of the world's 10 largest marine dead zones, has become the first 'macro-region' targeted by the EU. Meanwhile the UK government has proposed a plan that would require water companies to invest £56bn over 25 years in infrastructure to reduce the use of storm overflows for sewage.<sup>5</sup>

PFAS are also in regulators' sights. The US Environmental Protection Agency is proposing legally enforceable maximum levels of certain PFAS in drinking water and monitoring by public water systems.<sup>6</sup> The EU meanwhile is looking to ban the production, use and sale of all PFAS, with scientific committees working towards a vote in 2025.<sup>7</sup>







“Like biodiversity, though, water is often not priced as a scarce and valuable resource and so continues to be misused and exploited.”

## Flowing in the right direction

As water flows downstream and moves around oceans, human activities influence its quality and have direct and indirect impacts on nature that are increasingly understood. Like biodiversity, though, water is often not priced as a scarce and valuable resource and so continues to be misused and exploited.

More detailed water reporting would help investors better identify and assess risks facing companies. Local context is almost always missing, despite it being critical to understanding water quality-related impacts. In a watershed where water is very scarce or polluted, for example, each megalitre of water treated - an impact metric that Impax uses - is more impactful than in one with abundant, clean water.

Proposed sustainability reporting frameworks do not go far enough, unfortunately. Although International Sustainability Standards Board (ISSB) disclosure standards do require that companies in some water-intensive industries report what proportion of their plants are in water-stressed areas, this is not enough detail for risks and opportunities to be quantified. Location-specific water impact analysis is only made possible by detailed disclosure of important physical assets' geolocations.

Despite measurement and reporting challenges, we are encouraged by growing government focus on water quality and biodiversity issues. In this context, we believe that companies with solutions to improve water quality, upstream to downstream, can benefit from regulatory tailwinds and help address pressing environmental challenges.

## INDEX

- 1 Environmental Working Group, 2023: Groundbreaking map shows toxic 'forever chemicals' in more than 330 wildlife species
- 2 Wall Street Journal, 27 July 2019: Florida's Red Tide Killed At Least 174 Dolphins
- 3 Central Arkansas Water issued a certified green bond to purchase forest in its catchment area in November 2020
- 4 Nikkei Asia, 22 April 2021: TSMC tackles Taiwan drought with plant to reuse water for chips
- 5 Department for Environment, Food & Rural Affairs, 2022: Storm Overflows Discharge Reduction Plan
- 6 US Environmental Protection Agency, March 2023: Proposed PFAS National Primary Drinking Water Regulation
- 7 European Chemicals Agency, 2023



Global Head of Sustainability & Stewardship for Impax, **Lisa Beauvilain** is responsible for the oversight and development of sustainability research and methodologies, including the Impax Sustainability Lens and the firm's proprietary ESG analysis, as well as overseeing Impax's stewardship work. She is the Chair of Impax's ESG and Sustainability Lens committees and Co-Heads the firm's impact investment work. She started working in the financial industry in 1999 and previously worked as an executive director in the Investment Management Division of Goldman Sachs in London.



**Johan Florén**, Chief ESG & Communication Officer at AP7 joined the firm in 2009. He has been chairman of Sweden's forum for sustainable investments (SWESIF) and chairman of the Amnesty Business Group in Sweden. Before AP7 Johan worked in the private sector. He has several degrees, including philosophy, political science and marketing from Stockholm and Uppsala universities.

Sjunde AP-fonden (AP7) is a Swedish public pension fund with whom Impax has partnered since 2018 to investigate how best to assess, measure and report on water impact. The partnership between AP7 and Impax offers an investment practitioner's perspective that will contribute to the investment industry's understanding of water as a sustainability and impact topic.

## KEY TAKEAWAYS

- Despite growing recognition of biodiversity's critical importance to global society, water impacts on nature are systematically underestimated. Water quality issues are also challenging to address.
- A tightening regulatory environment supports innovative approaches and technologies that address water quality issues throughout the water system. This creates opportunities for solutions providers.
- Local context is almost always missing from company water reporting, despite it being critical to understanding water quality-related impacts. Disclosure standards should go further in their requirements.

# EMERGING MARKETS EQUITIES: POSITIONED FOR A REBOUND?

*“Many of the core issues confronting developed markets—inflation, monetary tightening, equity-market derating, and downward earnings adjustments—are playing out differently in EMs.”*



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In a bleak year for equity investors globally, several emerging markets (EMs) have been among the best performers on a relative basis. Although the economic and monetary pictures vary dramatically among EMs, developing economies broadly are further ahead than developed markets in their monetary tightening and equity derating cycles.

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This cyclical positioning and the resilient macroeconomic fundamentals of EMs lead us to believe that EMs are better positioned for equity gains in 2023 than developed economies.

In this article, we examine key economic and investment themes facing EM investors and highlight several important regions. We also look at the long-term trends we believe are creating an increasingly attractive EM investment opportunity set for equity investors.

## FIVE THEMES SHAPING THE EM EQUITY LANDSCAPE

Many of the core issues confronting developed markets— inflation, monetary tightening, equity-market derating, and downward earnings adjustments—are playing out differently in EMs. In many cases, EMs are further along in working through these issues, creating optimism for investors.

### Inflation

EM economies, in general, have less of an inflation problem than developed economies. This gives EM central banks more policy options, including restimulating into a global downturn.

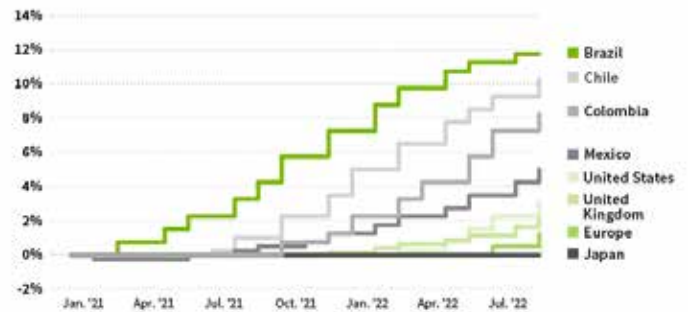
Brazil, Mexico, and other Latin American countries began raising interest rates well before the United States and Europe. Brazil moved furthest; its policy rate was 13.75% as of October 2022, which explains why the Brazilian real has been the top-performing currency against the U.S. dollar in 2022, up 7.3% through November 2022. Inflation rates in these countries remain moderate to high but have started to trend down. All of these countries exhibit positive real interest rates, unlike the United States and Europe.

Inflation in Asia is relatively modest. China, in particular, is experiencing inflation well below the EM average, giving Chinese policymakers room to become even more stimulatory in 2023.

## EM Countries Are Far Ahead of the United States in Raising Interest Rates

By starting their rate-hiking cycles well ahead of developed markets, several EMs appear better positioned to manage inflation and provide leadership in equity markets in 2023.

Cumulative Changes in Interest Rates Since January 2021



Source: Bloomberg and William Blair, as of September 30, 2022.

### Valuations and Earnings Estimates

Equities have already derated in many EMs, suggesting that these countries are now in the late stages of a bear market. They seem now better positioned for a rebound, especially given that we expect interest-rates cuts and other stimulative measures to come in 2023.

Many metrics suggest that the EM bear market is getting long in the tooth. Historically, the average EM bear market has lasted 263 days and produced a 38.2% drawdown, according to Morgan Stanley. The current EM bear market, which began in February 2021 when China tech stocks peaked, is nearly 600 days old, and the MSCI EM Index was down 40% heading into October 2022.

EM valuations have derated 39% versus an average of 34% for EM bear markets, and EM earnings estimates have been downgraded sharply in 2022, in contrast to the United States and Europe, where the negative earnings revision process has barely begun.



“Given the combination of price declines, the derating of valuation multiples, and earnings estimate cuts, we believe that EM equity markets have already readjusted and are better positioned for recovery than developed markets.”

Given the combination of price declines, the derating of valuation multiples, and earnings estimate cuts, we believe that EM equity markets have already readjusted and are better positioned for recovery than developed markets. Some select EM equity markets have already been among the top performers globally in 2022 through November, among them Brazil (+17.64%), Mexico (+5.12%), and India (-2.62%), according to Bloomberg.

## EM Earnings Estimates Are Ahead in Their Readjustment Phase

Analysts began downgrading earnings estimates for EM companies in mid-2021, and this process is still in its early phases in the United States and Europe.

### 12-Month Forward Earnings Per Share



Sources: MSCI, IBES, Morgan Stanley Research, and Williams Blair, as of November 2022. 12-month forward earnings per share (EPS) is rebased to 100 in January 2020. Indices are unmanaged and do not incur fees or expenses. A direct investment in an unmanaged index is not possible.

## Currency Exchange Rates

EM equities typically underperform when the U.S. dollar is strong. We believe that the U.S. dollar is likely close to peaking, which could be a bullish signal for EM equities.

As an asset class, the relative performance of emerging markets tends to be negatively correlated with a strong U.S. dollar. As the dollar rises, EM equities tend to underperform because their currencies come under pressure, and these countries must raise interest rates to protect the exchange rate. Once the dollar peaks, that pressure abates—monetary policy can loosen, and equity markets typically rerate higher. We expect the U.S. dollar to peak, which would likely turn a headwind into a tailwind for EM equities in 2023.

## Style Rotation

There has been a recent shift in leadership among EM style factors, with the outperformance of value-oriented equities starting to abate somewhat.

EM value stocks outperformed in the first half of 2022, as is typical when interest rates rise. Since then, the global economic regime

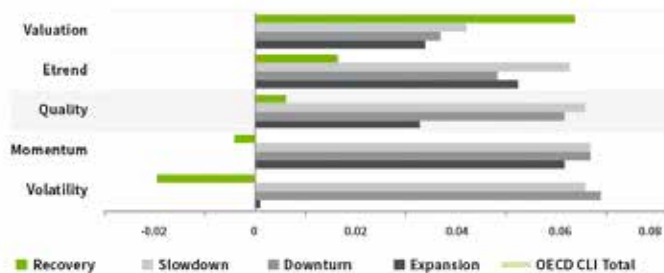
has switched from “slowdown” to “downturn,” as defined by the Organisation for Economic Co-operation and Development (OECD) composite leading indicator, and other equity factors have taken leadership—namely quality, earnings trend, and momentum.

In an economic downturn, higher-growth EM stocks that have derated and have strong and stable earnings could outperform, in our opinion. Strong earnings are usually rewarded in a downturn because most companies’ earnings growth tends to weaken and/or decline as the economic downturn progresses. Higher-quality companies generally do better under financial tightening because they have either (a) easier access to credit or (b) stronger balance sheets and are generally self funded. Low-volatility stocks are at a premium because they are more defensive and less exposed to cyclical.

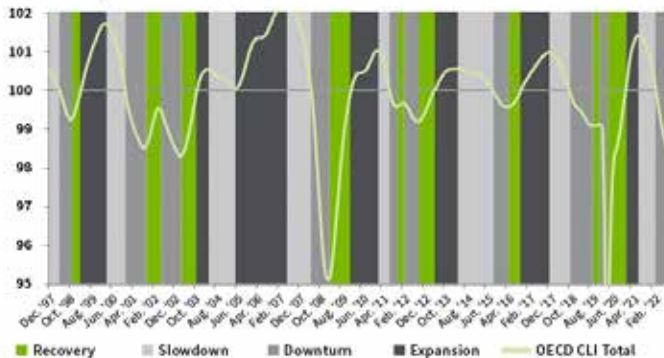
## Style Leadership Shifted in Mid-2022

While value-oriented EM equities outperformed for most of 2022, value’s leadership started to weaken later in the year, as is often seen in periods of slowing or low economic growth.

### MSCI EM IMI Information Coefficient Across Regions



### OECD Composite Leading Indicator (CLI)



Sources: MSCI and William Blair, as of October 2022. Past performance is not indicative of future returns. Fundamental model performance is provided for illustrative purposes only. Information is based on William Blair’s proprietary quantitative models and does not in any way relate to actual results of any account or strategy. Coefficient represents the Spearman ranked correlation between factor score and future performance. A positive IC suggest that a given factor has exhibited predictive power of future performance during the backtest period.





## EMS OF INTEREST

### China

The growth outlook remains muted and cloudy while zero-COVID policies persist. But the completion of the recent National Congress could provide clarity and raise the possibility of more stimulative monetary and fiscal policies as well as a roadmap out of zero-COVID policies.

Chinese equities have been among the worst performers in 2022, and valuations are at a 15-year low. The government's zero-COVID policy is much to blame, creating uncertainty and pessimism and causing consumer confidence to collapse. The government has provided some stimulus, but not enough to offset the impact of zero-COVID.

Other concerns include the government's targeting of technology companies and its reticence to address the property market issues, coupled with uncertainty as to the economic impact of the country's Common Prosperity doctrine, which is intended to promote equality.

Now that the 20th National Congress of the Chinese Communist Party wrapped up in late October 2022, party leadership may have a freer hand to focus on economic growth, setting the stage for China to relax zero-COVID policies and increase economic stimulus. As this occurs, we believe the Chinese equity market could be set to outperform.

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*“We believe rising per-capita income and a growing middle class are persistent structural tailwinds for Indian equity markets.”*

---

As a result, we raised our weighting in China in late 2022. We are still underweight China but less so than we were previously. Valuations appear attractive, and we are cautiously positive on possible policy changes ahead and early signs of a roadmap out of zero-COVID, more definitive support for the property market, and the economy in general.

### India

The country enjoys very favorable fundamentals, including strong economic growth, a pro-business government, and a large and growing middle class of more than 300 million people. But we recognize that some of these are factored into the Indian equity market's valuation premium.



“EM companies punch well above their weight globally with regard to sustainable value creation, as measured by return on capital employed.”

Despite its valuation premium versus other EMs, we are overweight India. In our view, its positives include favorable demographics, a well-educated population, strong economic growth, a pro-business government, and an English legal system and a relatively high degree of visibility into how monetary and fiscal policies are executed.

We believe rising per-capita income and a growing middle class are persistent structural tailwinds for Indian equity markets. When per-capita income crosses the \$2,000 mark, developing countries typically see an explosion of demand for consumer goods and services, from household appliances to mortgage loans. India is at that inflection point—over 40% of the population is already there, and this is expected to rise to 60% by 2025, according to Spark Capital.

Inflows from domestic retail investors also act to underpin Indian equity markets. Systematic investment plans (SIPs) that automatically invest in mutual funds have become wildly popular. The share of equities in household savings is at an all-time high of around 5%, having been as low as 2.5% only a few years ago—but it still has a long way to grow before approaching the levels of more developed countries.

In India, we are constructive on financials and housing-related stocks. In the financial sector, penetration levels of financial products are extremely low and set to rise along with the emerging middle class. In addition, high-quality private-sector banks in which we invest have the potential to take a huge amount of market share from public-sector banks that still control nearly 70% of the Indian financial sector. In housing, affordability is at a 10-year high, and the market is booming, which we believe are positive tailwinds for our Indian financial and property-development companies.

## Other EMs to Watch

**BRAZIL:** Brazil raised interest rates sharply in 2021 to counter high inflation. These moves drastically hurt equity markets in 2021 but put Brazil much further ahead in the monetary cycle than most countries. Brazil has been a top-performing equity market this year (as of November 2022). We expect Brazil to be one of the first countries globally to begin a rate-cutting cycle,

perhaps early in 2023. Once this happens, we expect investors to take a positive view of forward growth, corporate fundamentals to improve, and valuations to rise.

**INDONESIA:** Indonesia has an attractive combination of strong gross domestic product (GDP) growth, moderate inflation, and gently rising interest rates combined with a strong demographic profile and an emerging middle class. We believe this provides a long runway for secular growth. Indonesia is also a beneficiary of commodity-price increases and a reform-minded government. In our view, corporate fundamentals are predominantly good and valuations appear reasonable, and the economy is still on a strong growth trajectory. We are overweight Indonesia, particularly financials.

**SAUDI ARABIA:** Saudi Arabia now represents more than 4% of the MSCI EM Index. It has in some ways filled the gap that Russia left when it was removed from the index after invading Ukraine. Saudi Arabia's market is active with numerous initial public offerings (IPOs) and a plethora of companies benefiting from strong oil prices and the transformation of the country's economy. The economy is evolving rapidly; women are increasingly in the workforce, more social events are allowed, and tourism is encouraged.

## **RICH AND GROWING OPPORTUNITY SET FOR QUALITY GROWTH INVESTORS**

EM companies punch well above their weight globally with regard to sustainable value creation, as measured by return on capital employed. As of December 2021, EMs represented slightly more than 10% of the MSCI ACWI IMI by market cap but accounted for about 40% of the global top quintile of quality growth companies as defined by sustainable value creation, up from about 15% in 2002. By contrast, the United States represented about 60% of the index but less than roughly 30% of the top value quintile.

Many of these quality growth companies are in China and India, which have rising per-capita income, a fundamental driver of sustainable value creation. Opportunities to find quality in these countries are abundant. For example, about 40% of China A-share companies—more than 1,200 companies in total—exhibit

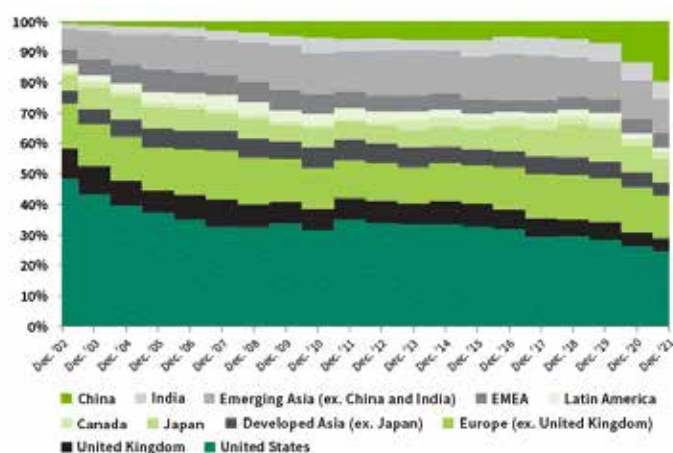


higher quality, based on return on equity (ROE), than the average of the broader EM universe. In India, 20% of companies have higher ROE than the EM average, which represents around 400 companies.

## EM Continues Growing Its Share of Sustainable Value Creation

For investors focused on finding companies that generate strong returns on capital and exhibit other quality characters, EMs continue to represent growing share of the top companies in terms of sustainable value creation.

### Top Quintile of Sustainable Value Creation Companies by Region



Sources: MSCI and William Blair, as of December 2021. Countries are those in the MSCI Emerging Markets Investible Market Index (IMI). Sustainable value creation is an aggregate measure of corporate returns on capital. Several quantitative financial statement factors are used to measure total corporate profit/cash flow relative to total invested capital, corporate equity profit/cash flow relative to invested equity capital, as well as operating efficiency.

## Sectors to Watch

We identify two specific sector opportunities going into 2023 and beyond:

**TECHNOLOGY:** We believe the semiconductor industry is in the midst of a cyclical slowdown, but the long-term, secular growth story remains very attractive. While we have tactically reduced our technology hardware exposure, we will look to increase positions as opportunities arise in 2023.

**HEALTHCARE:** Healthcare expenditure in developing countries ties into the growth dynamic of an emerging middle class. Healthcare spending in EM countries is well below developed country averages, both per capita and as a percentage of GDP. We believe this is another secular growth path that will track income growth, and we are positioning ourselves accordingly.

## Green Economy

We believe the world's transition to a low-carbon economy offers strong growth opportunities for years to come. Decreasing

cost curves, increasing innovation, and policy/societal support are some of the factors boosting adoption and growth.

Many EM companies are well positioned for this transition; some are even global leaders in the space, especially in solar and electric vehicle (EV) batteries.

We believe growth momentum and investments could accelerate in the coming years as the world seeks to reach net-zero targets. We have increased exposure to renewable energy and energy storage and their supply chains across our portfolios.

## Final Thoughts

The EM bear market is long in the tooth in terms of time, price, and multiples. Earnings expectations have already been cut, and many EMs are well ahead of developed markets in monetary tightening. EMs could be a bright spot in a cloudy picture for equities globally in 2023.



**Todd McClone, CFA, partner,** is a portfolio manager for William Blair's emerging markets strategies, including Emerging Markets Leaders, Emerging Markets Growth, Emerging Markets Small Cap Growth, and Emerging Markets ex China Growth. Before joining the firm in 2000,

he was a senior research analyst specializing in international equity for Strong Capital Management. Previously, he was a corporate finance research analyst with Piper Jaffray, where he worked with the corporate banking financials team on a variety of transactions, including initial public offerings, mergers and acquisitions, and subordinated debt offerings. He also issued fairness opinions and conducted private company valuations. Todd received a B.B.A. and B.A. from the University of Wisconsin-Madison.

## FOR YOUR REFERENCE

The MSCI ACWI IMI captures large-, mid-, and small-cap representation across 23 developed markets. The MSCI EM Index captures large- and mid-cap representation across 27 EMs. The MSCI EM IMI captures large-, mid- and small-cap representation across 27 EMs. The S&P 500 Index tracks the performance of 500 large companies listed on stock exchanges in the United States. The STOXX Europe 600, also called STOXX 600, tracks the performance of European stocks. Index performance is provided for illustrative purposes only. Indices are unmanaged and do not incur fees or expenses. A direct investment in an unmanaged index is not possible.



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# SACRS SPRING CONFERENCE

MAY 9-12, 2023 | PARADISE POINT RESORT & SPA | SAN DIEGO, CA

SACRS

## CONFERENCE AGENDA

### TUESDAY, MAY 9

**3:00 PM - 5:00 PM**

#### PRE-CONFERENCE TRAININGS

Ethics Training for Trustees and Staff: More Than A Concept  
Sexual Harassment Prevention Training for Local Agency Officials

**4:00 PM - 5:00 PM**

#### In Solidarity - Labor and Labor Allies Networking

Sustainable Returns - Safe and Equitable Workplaces,  
Investment Risk and Fiduciary Duty

Service Employees International Union (SEIU) Strategic Initiatives  
Department's Assistant Director Michael Ring and Deputy  
Director Renaye Manley

**5:30 PM - 6:30 PM**

#### SACRS Welcome Reception

### WEDNESDAY, MAY 10

**7:00 AM - 8:00 AM**

SACRS Wellness Session - Yoga

**8:45 AM - 9:00 AM**

General Session Welcome

**9:00 AM - 10:00 AM**

China: Friendly Competitor or Geopolitical Threat,  
Implications for the Fiduciary

KraneShares Managing Director and General Counsel  
Ambassador (Ret.) David Adelman

**10:30 AM - 11:30 AM**

Lessons from the Playing Field

DeMaurice Smith, Executive Director, National Football League's  
Players' Association (NFLPA)

**11:30 AM - 12:30 PM**

Girls Who Invest

Michelle DeFossett, Chief Operating Officer, Girls Who Invest

**2:00 PM - 4:30 PM**

SACRS BREAKOUTS

Administrators, Affiliate, Attorney, Internal Auditors, Investment  
Officers, Operations/Benefits, Safety, and Trustee

**6:30 PM - 9:30 PM**

AHOY! SACRS Annual Wednesday Night Event at Paradise  
Point Resort

### THURSDAY, MAY 11

**7:00 AM - 8:00 AM**

SACRS Wellness Session - Fun Run/Walk

**8:45 AM - 9:00 AM**

General Session Welcome, Volunteer Awards

**9:00 AM - 10:00 AM**

Ukraine and Beyond: The Geopolitics of 2023

Michael O'Hanlon, Author & Senior Fellow, Phil Knight Chair,  
Brookings Institution

**10:30 AM - 11:30 AM**

Diversity Equity and Inclusion - An Integrated Approach

Shawna Ferguson, Partner, Senior Managing Director, Global  
Diversity, Equity & Inclusion, Wellington Management; Jackson  
Cummings, Head, Wellington Access Ventures, Wellington  
Management; and Ron Taylor, Portfolio Specialist, T. Rowe Price

**11:30 AM - 12:30 PM**

Sea Change - A Profound or Notable Transformation

Howard Marks, CFA, Co-Chairman, Oaktree Capital Management

#### SACRS CONCURRENT SESSIONS

**2:00 PM - 3:00 PM**

- A. Fixed Income - In Vogue and Sexy Even!
- B. ASOP 4 and LDROM: What Do We Do With Some Not  
So Bad and Not So Good News from the Actuaries?
- C. Digital Assets: Your Portfolio Is Likely Under-Allocated

**3:30 PM - 4:30 PM**

- A. Legislative Update 2023
- B. Private Equity Co-Investing In 2023
- C. Developing a Risk Mitigating Strategies (RMS) Action Plan

**4:30 PM - 5:30 PM**

SACRS Education Committee Meeting  
SACRS Nominating Committee Meeting

**5:30 PM - 6:30 PM**

SACRS Reception

### FRIDAY, MAY 12

**9:00 AM - 10:00 AM**

Examining the Experiences of Public Pension Plans Since  
The Great Recession

Tyler Bond, Research Director, National Institute on Retirement  
Security and Todd Tauzer, FSA, National Public Retirement  
Leader, Segal

**10:15 AM - 11:30 AM**

SACRS Annual Business Meeting





**Ambassador (Ret.) David Adelman**  
Managing Director and General Counsel  
Krane Funds Advisors



**DeMaurice Smith**  
Executive Director  
National Football League's  
Players' Association



**Michelle DeFossett**  
Chief Operating Officer  
Girls Who Invest

## EDUCATION AND INSPIRATION

### Keynotes



**Michael O'Hanlon**  
Senior Fellow, Phil Knight Chair  
Brookings Institution



**DeMaurice Smith**  
CFA, Co-Chairman  
Oaktree Capital Management



### Special Guest Moderator **Kellie DeMarco**

Kellie is an Emmy-award-winning journalist who's interviewed thousands of newsmakers and traveled the country covering breaking news. She anchored the news for nearly two decades—most recently at the NBC affiliate, KCRA in Sacramento. Kellie now leads a successful media relations agency to give businesses and nonprofits the VOICE to be heard, so they can make an even greater impact in their community.



# State Association of County Retirement Systems LEGISLATIVE REPORT

The bill introduction deadline was on February 17. By this date, over 2,600 bills were introduced. Many of these bills were “spot” or “intent” bills that did not yet have substantive language and were serving as placeholders until formal bill language was finalized.

The Legislature had until April 28 for all fiscal bills to be heard. Until this date (aside from Spring Recess from March 30 – April 10), the Legislature was busy conducting hearings for bills introduced this year. By this point, most of the “spot” or “intent” bills have been amended with substantive language to allow them to move forward in the legislative process and get a hearing in policy committee.

Non-fiscal bills have until May 5 to be heard in policy committee.

## LEGISLATION OF INTEREST

**AB 1020 (Grayson) - CERL Disability Presumptions.** This bill would establish several new disability retirement presumptions for various injuries and illnesses in the CERL, similar to provisions

that exist in the Labor Code. The bill is sponsored by the California Professional Firefighters.

**SB 252 (Gonzalez) - PERS and STRS Fossil Fuel Divestment.** Senator Gonzalez reintroduced SB 1173 from last session. Like last year, this bill applies to CalPERS and CalSTRS and prohibits the retirement systems from renewing or making new investments in fossil fuel companies, as well as requiring them to liquidate existing investments by July 1, 2030, among other requirements. The bill was introduced as part of a package of climate legislation.

**SB 660 (Alvarado-Gil) - CA Public Retirement System Agency Cost and Liability Panel.** This bill would establish the CA Public Retirement System Agency Cost and Liability Panel that would be tasked to determine how costs and unfunded liability are apportioned to a public agency when a member changes employers within the same retirement system or concurrently retires with two or more systems that have entered into a reciprocity agreement. The panel would include a member from the State Association of County Retirement Systems (SACRS).



**“The Legislature had until April 28 for all fiscal bills to be heard.”**

## **PUBLIC MEETING BILLS**

Since the onset of the COVID-19 pandemic, teleconferencing flexibilities have become a subject of interest in California's Legislature, with local government groups sponsoring various bills on the topic since 2021. This session is no exception, and a handful of bills have been introduced:

**AB 557 (Hart) - AB 361 Sunset Extension.** This bill would remove the sunset established in AB 361 (R. Rivas) as well as increase the time period when the Board must renew the findings of an emergency or need for social distancing from 30 days to 45 days.

**AB 817 (Pacheco) - Open Meeting Flexibility for Subsidiary Bodies.** This bill allows subsidiary bodies to use teleconferencing without regard to a state of emergency if they meet certain requirements. Subsidiary bodies are bodies that serve in an advisory capacity and do not take final action on specified items.

**AB 1379 (Papan) - Teleconference Flexibilities.** AB 1379 expands various flexibilities for local agencies under the Brown Act including, but not limited to, relaxing requirements for posting teleconference locations, relaxing certain quorum requirements, removing the existing January 1, 2026 sunset date of flexibilities in current law, removing restrictions that prohibit members from participating remotely for more than two meetings a year, among other changes. The bill also requires that a legislative body have at least two meetings a year where members are in person at a single designated location.

**SB 411 (Portantino) - Teleconferencing for Appointed Bodies.** This bill would allow local legislative bodies with appointed members to use teleconferencing indefinitely regardless of the presence of an emergency. The author intends this bill to apply to neighborhood councils. The bill is an urgency bill and therefore requires a 2/3 vote.

**SB 537 (Becker) - Teleconference Flexibilities.** This bill was recently amended with substantive language that allows multijurisdictional, cross county legislative bodies to use teleconferencing indefinitely and without regard to a state of emergency and adds certain requirements, like requiring a legislative body to provide a record of attendance on its website within seven days of the meeting. The bill also adds to the list of circumstances where a member is permitted to participate remotely. We have met with the author's staff and are preparing

some amendments to clarify that local retirement systems are covered by the bill. The bill is an urgency bill and therefore requires a 2/3 vote.

**AB 739 (Lackey) - PEPRA Defined Benefit Funding.** Under the requirements for suspending contributions to a defined benefit plan, this bill would increase the threshold percentage amount of plan funding from more than 120 percent to more than 130 percent. However, after inquiring about the bill, the author's office informed us that the bill is a "spot" bill that will not be moving this year.



**Michael R. Robson** has worked since 1990 in California politics and has been lobbying since 2001 when he joined Edelstein, Gilbert, Robson & Smith LLC. Prior to joining the firm, he began a successful career with Senator Dede Alpert as a legislative aide soon after she was elected to the Assembly in 1990. He became staff director/chief of staff in 1998, while the Senator served in the position of Chair of the Senate Appropriations Committee. He is experienced in all public policy areas with particular expertise in environmental safety, utilities, revenue and taxation, local government finance, education, and the budget.



**Trent E. Smith** worked for over 12 years in the State Capitol prior to joining the Edelstein, Gilbert, Robson & Smith LLC. He started his career in 1990 working for the well-respected late Senate Republican Leader Ken Maddy. He was later awarded one of 16 positions in the prestigious Senate Fellowship Program. Upon completion, he started working in various positions in the State Assembly. He worked as a Chief of Staff to Assembly Member Tom Woods of Redding and later to Orange County Assembly Member, Patricia Bates, who served as Vice Chair of the Assembly Appropriations Committee. In this position, he gained a unique and valuable knowledge of the State budget and related fiscal policy matters. In addition, he has extensive experience in numerous policy areas.



**Bridget McGowan** joined Edelstein Gilbert Robson & Smith in 2018. Prior to joining the firm, she gained policy experience in the California State Assembly. Through internships in the district office of her local Assemblymember and later, in the office of the Chief Clerk, McGowan developed her knowledge of California's legislative process, rules and procedures. A graduate from UC Davis in 2018 with a Bachelor of Arts in International Relations, she is currently pursuing a Master of Public Administration from the University of Southern California Price School of Public Policy.



## PUBLIC PENSION PLAN FUNDING POLICY - PART THREE

# Effectiveness of Amortization Methods Under Stochastic Returns

One of the most important decisions made for public sector pension plans is adopting a funding policy that balances the needs of all stakeholders. In general, larger benefits require larger contributions. For a given benefit level, the purpose of a funding policy is to balance the level and volatility of contributions with the funded ratio of the plan.

In this article, we continue to explore, compare, and contrast various methods of amortizing liabilities and their impact on the contribution rates allocated to employers.

Plan sponsors use a variety of methods to determine the amortization amount. This article examines the following methods, with amortization periods varying from 10 years to 30 years.

- **Layered method**, where an additional layer of amortization is calculated each year based on the experience or

assumption changes made that year. In this article, the first layer is the current unfunded liability, also known as the net pension liability, or the difference between the actuarial value of assets and the total pension liability.

- **Rolling method**, where the amortization is reset annually based upon the entire net pension liability. The amortization period remains constant, resulting in a consistent percentage of the net pension liability paid each year.

- **Aggregate cost method**, which considers the entire actuarial present value of benefits. The difference between the actuarial present value of benefits and the actuarial value of assets is divided by the actuarial present value of future salaries for members as of the valuation date to calculate the contribution rate. This contribution rate is then applied to current salaries.

In the first article of this series, *Public Pension Plan Funding Policy: Effectiveness of Amortization Methods Under Deterministic Projections*, which appeared in the Spring 2022 issue of *SACRS Magazine*, we developed a framework to help plan sponsors understand the funding policy implications of their choice of amortization method if all actuarial assumptions are perfectly met. In the second article, *Public Pension Plan Funding Policy: Effectiveness of Amortization Methods Under Projected Investment Scenarios*, which appeared in the Summer 2022 issue of *SACRS Magazine*, we studied how the various amortization methods reacted to different paths of asset returns. This article expands



“ Stochastic modeling involves using a random number generator to perform a statistical analysis where 1,000 or more runs are created to test the likelihood of future events. ”

that discussion to focus on how the various amortization methods handle a larger set of deviations from expectations and react to volatility in investment markets.

## STOCHASTIC MODELING

Stochastic modeling involves using a random number generator to perform a statistical analysis where 1,000 or more runs are created to test the likelihood of future events. This is also sometimes referred to as Monte Carlo analysis.

In this article, we focus on the volatility inherent in investment markets. We developed 1,000 “random walk” scenarios for the plan’s actual asset returns via stochastic projections using a random number generator. Throughout the remainder of this article, we review how each of the amortization methods react to these scenarios.

Stochastic projections over the 40-year period were generated using a normal distribution, a 7.00% geometric average annual return, and a standard deviation of 12.00%. The equivalent average arithmetic return is 7.72%.

## PLAN MODELED

For purposes of this article, we modeled a “typical” public plan. We use a 7.0% expected return on assets, which is a common assumption among public pension plans, an entry age normal actuarial cost method, and a fresh start for the amortization of the unfunded liabilities. We then explored multiple amortization methodologies. We set assets equal to 79% of liabilities, which is the aggregated funding level in the Milliman Public Pension Funding Index (PPFI) as of January 1, 2021. Additional key methods, assumptions, and plan provisions are listed in our appendix.

In our projections, other than the actual investment returns, we assume that all assumptions are met and that there are no other actuarial experience gains or losses.

## “CONES OF UNCERTAINTY” FOR CONTRIBUTION RATES AND FUNDED RATIOS

To give an idea of the potential range of future contribution rates and funded ratios, we ran a stochastic projection as described above and summarized the results to develop a “cone of uncertainty” for each amortization method studied. This type of projection allows the assessment of the likelihood of certain events in the 1,000 scenarios modeled. This stochastic projection uses these results to generate a distribution of future contribution rates and funded ratios.

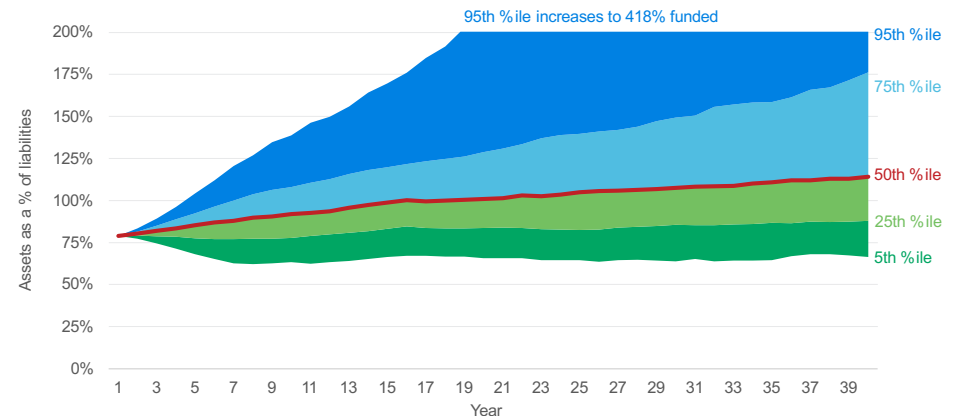
Under this type of analysis, we review the probability of an event occurring

rather than the specific results of any one scenario.

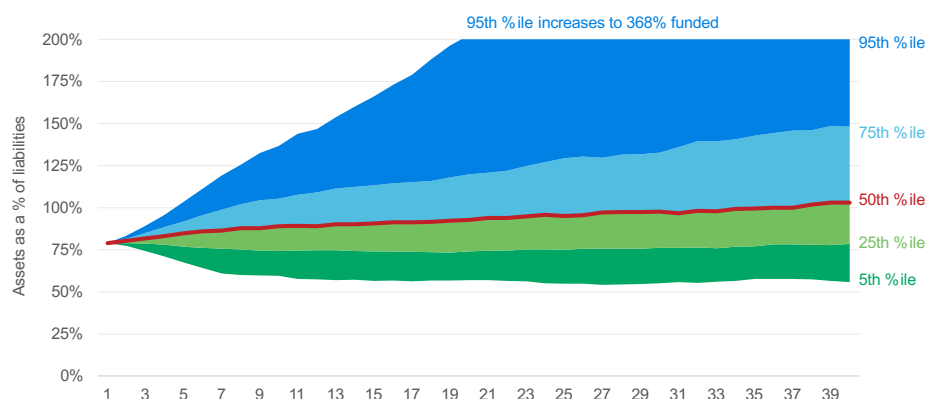
Figures 1 to 6 summarize the results over time. The median (or the 50th percentile) at any given time is shown by the red line. Half of the results are above the median each year, and half of the results are below the median. The light green and light blue shaded area reflects the 25th and 75th percentiles; 50% of the results are in the light green and light blue shaded area, while 25% are above and 25% are below. The dark green and dark blue shaded area reflects the 5th percentile and 95th percentile. Five percent of results are above the shaded area, and 5% are below.

Figures 1 and 2 show the projections of the funded ratios using both the Layered-15 and Rolling-15 amortization methods. While the shape of the cones under Layered-15 and Rolling-15 is similar, the funded ratio under Layered-15 generally tends to be higher than Rolling-15.

**FIGURE 1: LAYERED-15 FUNDED RATIO CONES OF UNCERTAINTY**



**FIGURE 2: ROLLING-15 FUNDED RATIO CONES OF UNCERTAINTY**



Next, in Figures 3 and 4, we examine the projections of the contribution rates again using both the Layered-15 and Rolling-15 amortization methods. Note the

discontinuity after year 15 in the Layered-15 projection. As the plan modeled was 79% funded at the beginning of the projection a large initial amortization

layer was established in year zero. This layer expires in year 15, which leads to the discontinuity.

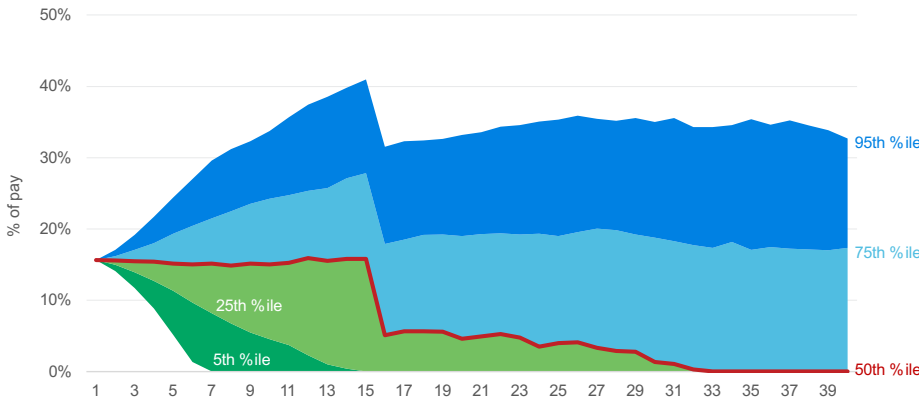
One limitation of the cones is the illusion of smoothness. The path of a single scenario can be quite volatile. To highlight this volatility, we layer a single scenario on top of the cones of uncertainty in Figures 5 and 6.

The black line represents the funded ratio and employer contributions under Layered-15 for the 500th scenario compared to the cones of uncertainty. We selected the 500th scenario by ordering the scenarios from lowest to highest based on the cumulative return over the 40-year projection period. This median scenario had an annualized compound return of 6.93%, slightly less than the 7.0% expected. For more details, see *Public Pension Plan Funding Policy: Effectiveness of Amortization Methods Under Projected Investment Scenarios*, where we analyze the different methods under this scenario.

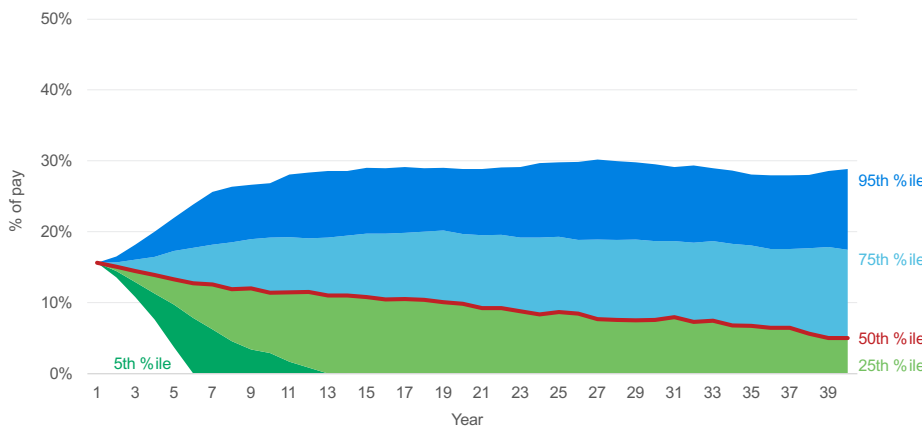
The black line representing this scenario is an example of the volatility a plan may encounter. This volatility is hidden when examining all scenarios at once. Note that, under a single scenario, the plan may experience funded ratios and employer contributions both below and above the 95th percentile at some point during the 40-year projection period. The single scenario 500 highlighted above demonstrates this phenomenon.

Please see the appendix for a summary of the assumptions used and examples of the cones for the various amortization methodologies studied.

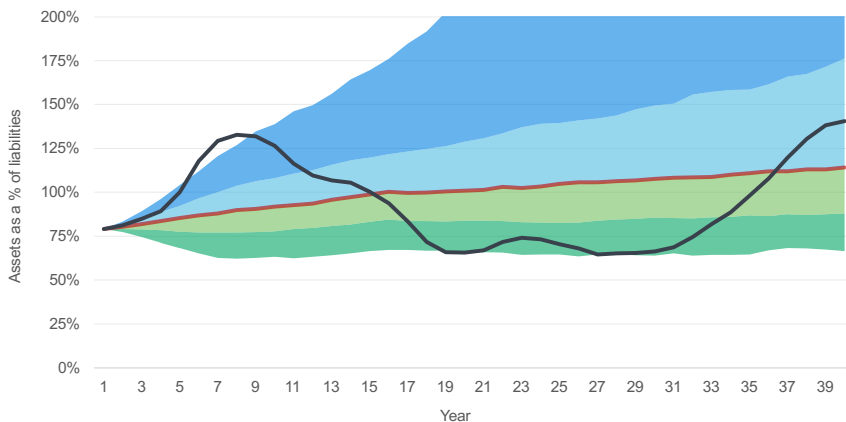
**FIGURE 3: LAYERED-15 EMPLOYER CONTRIBUTIONS CONES OF UNCERTAINTY**



**FIGURE 4: ROLLING-15 EMPLOYER CONTRIBUTIONS CONES OF UNCERTAINTY**



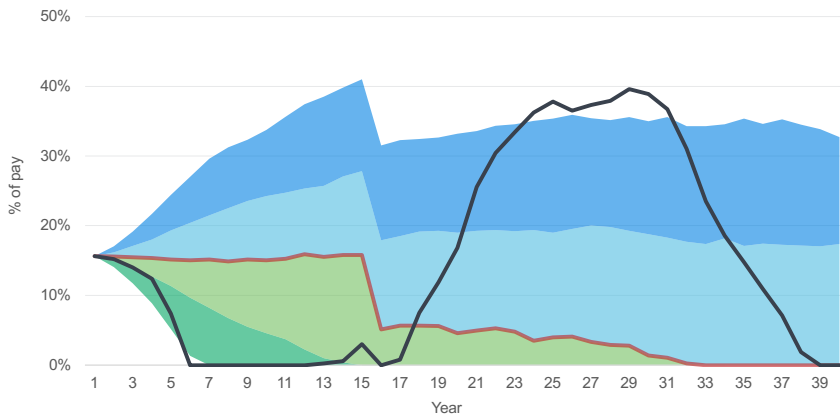
**FIGURE 5: LAYERED-15 FUNDED RATIO CONES OF UNCERTAINTY AND 500TH SCENARIO**



**“ We define a “pain point” as an event that would negatively impact the plan sponsor’s ability to continue to conduct its core functions. ”**



**FIGURE 6: LAYERED-15 EMPLOYER CONTRIBUTIONS CONES OF UNCERTAINTY AND 500TH SCENARIO**



## PAIN POINTS

We define a “pain point” as an event that would negatively impact the plan sponsor’s ability to continue to conduct its core functions. While a pension plan is an important benefit for the employees, if the funding of that plan requires unsustainably high or highly volatile contributions, then the plan may become a hindrance to conducting government business. Additionally, extreme or volatile funded ratios may be both a political and financial challenge.

### PAIN POINTS FOR CONTRIBUTION RATES

How do the various methods of amortizing liabilities impact the contribution rates, both in terms of level of contribution and volatility of contributions? Both variables, level of contributions and volatility, are instrumental in a plan sponsor’s ability to budget.

In general, for a given benefit level, plan sponsors prefer stable rates at manageable levels. However, plan sponsors may differ substantially in their appetite for volatility. In this section, we show examples of how the various methods of amortization differ in their contribution requirements.

A high level of contributions may preclude the employer from providing its primary services, including being able to provide competitive salaries, while volatile contributions can make budgeting and forecasting difficult, and could require levying additional taxes. High

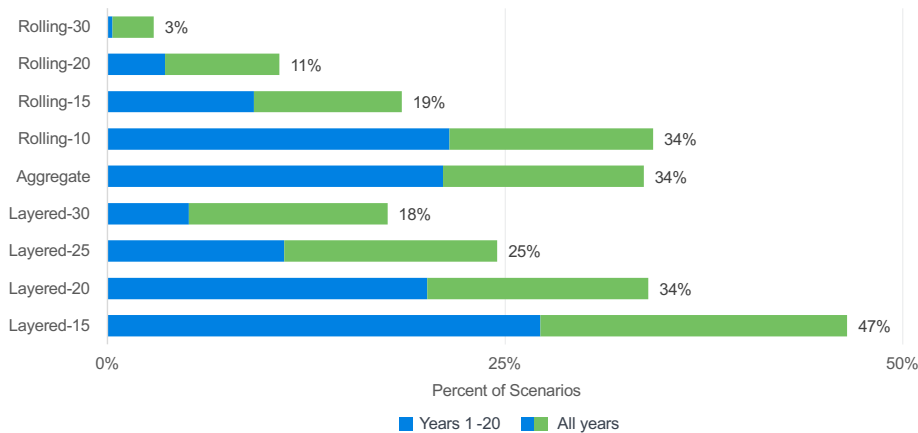
contributions could also lead to benefit reductions. While benefit reductions will eventually lead to lower costs, all else equal, those decreases can be slow to materialize, as many states have laws that restrict the ability to adjust benefits for current employees.

We focus on “pain points” for contribution rates. Employers will have different thresholds, but high absolute contributions and large movements in contribution rates will be common areas of concern. Note that, in the plan modeled, the normal cost rate ranges from 11.4% of payroll to 12.6% of payroll over time, with the employee paying 6% of pay. The initial employer contribution rates range from 12% to 19% based on the amortization period. For this article, the pain points are defined as:

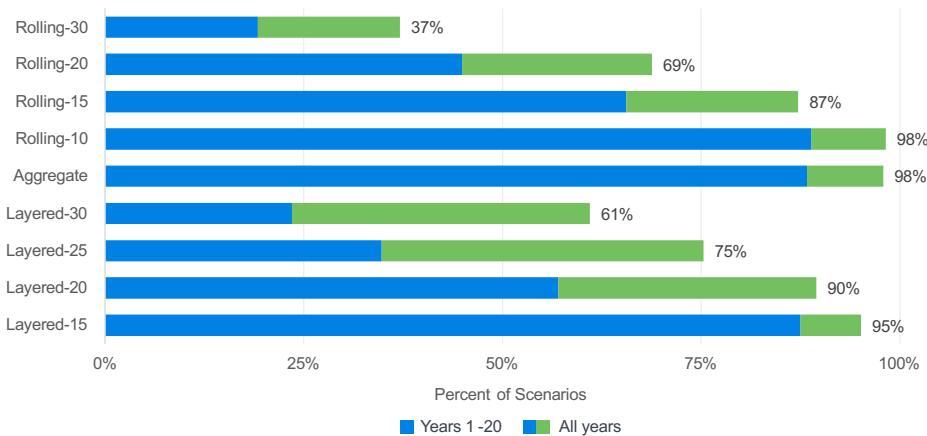
- Employer contribution rate in excess of 30% of payroll at some point in the projection period
- Increase in employer contribution rates of more than 10% of payroll over a five-year period at some point in the projection period
- Increases in employer contribution rates of more than 5% of payroll in a single year



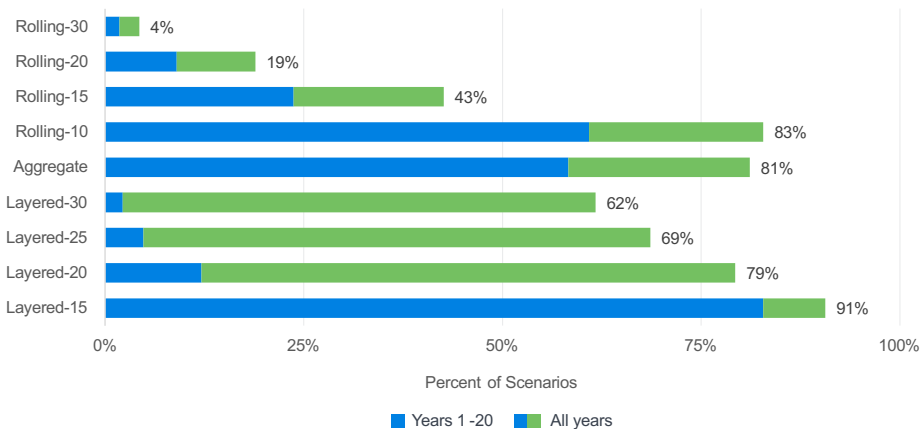
**FIGURE 7: EMPLOYER CONTRIBUTION RATE IN EXCESS OF 30% OF PAYROLL AT SOME POINT IN THE PROJECTION PERIOD**



**FIGURE 8: INCREASE IN EMPLOYER CONTRIBUTION RATES OF MORE THAN 10% OF PAYROLL OVER A FIVE-YEAR PERIOD AT SOME POINT IN THE PROJECTION PERIOD**



**FIGURE 9: INCREASES IN EMPLOYER CONTRIBUTION RATES OF MORE THAN 5% OF PAYROLL IN A SINGLE YEAR**



Figures 7 to 9 summarize the percentage of modeled scenarios that cross a pain point at some time during the 40-year horizon. Note that the larger the bars, the more likely that a pain point will be reached.

As shown in Figure 7, in nearly half of the scenarios under Layered-15, the employer contribution rate exceeded 30% of pay at some point in the 40-year projection period. Yet this only occurred in 3% of the scenarios under Rolling-30. While this lower likelihood of reaching this pain point is desirable, it is worth noting that the average (mean) contribution rates over the entire projection are only about 1% higher under Layered-15 than under Rolling-30 and yet Layered-15 ends the projection with a much higher average funded ratio (114%) than Rolling-30 (90%), as shown in Figure 20 on page 36.

Under Rolling-10, Aggregate, and Layered-15, increases in employer contributions of more than 10% of payroll over any given five-year period are almost certain. Even under Rolling-30, this pain point is not uncommon. Plan sponsors should be prepared to experience this type of increase when sponsoring defined benefit (DB) plans. Note that in Figures 8 and 9 the scale has increased from the 0%-50% range in Figure 7 to a range of 0% to 100% of scenarios.

Figure 9 shows that a 5% contribution increase in a single year is also quite likely under the Rolling-10, Aggregate, and Layered-15 methods. This is in stark contrast to Rolling-30, where only 4% of the scenarios see a year-over-year increase of 5% at some point in the projection.

**“ Employer contributions under the Rolling-30 method are by far the least likely to hit pain points under all three employer contribution stress tests. ”**





to provide its primary services. Second, low funding levels may impact the plan sponsor's financial flexibility by impairing its ability to issue debt.

For this article, the pain points are defined as:

- A market value of assets less than six times the benefits paid during the year
- A funded ratio less than 60%
- A funded ratio over 120%
- Failure to achieve a 100% funded status at any time during the projection period

Note that the larger the bars, the more likely that a pain point will be hit.

Figure 10 shows the percentage of scenarios that at some point during the 40-year projection have a market value of assets less than six times the benefits paid during the year. There may be concerns about the ability of a plan to pay for benefits when the market value of assets is this low.

Rolling-30 performs extremely poorly in this metric. In nearly 20% of the scenarios, there would have been serious concerns about the plan's ability to pay benefits. Plan sponsors who utilize Rolling-30 need to be aware of this potential pain point.

It is clear why Rolling-30 has been a popular method. Employer contributions under the Rolling-30 method are by far the least likely to hit pain points under all three employer contribution stress tests. In a vacuum, where only employer contribution rates are considered, Rolling-30 could be a preferable method. But while Rolling-30 minimizes the pain points for contributions, the method can lead to serious challenges in funding the benefits, as we will show.

benefit cost allocated to past and present employees based on the funding policy will need to be paid by future generations.

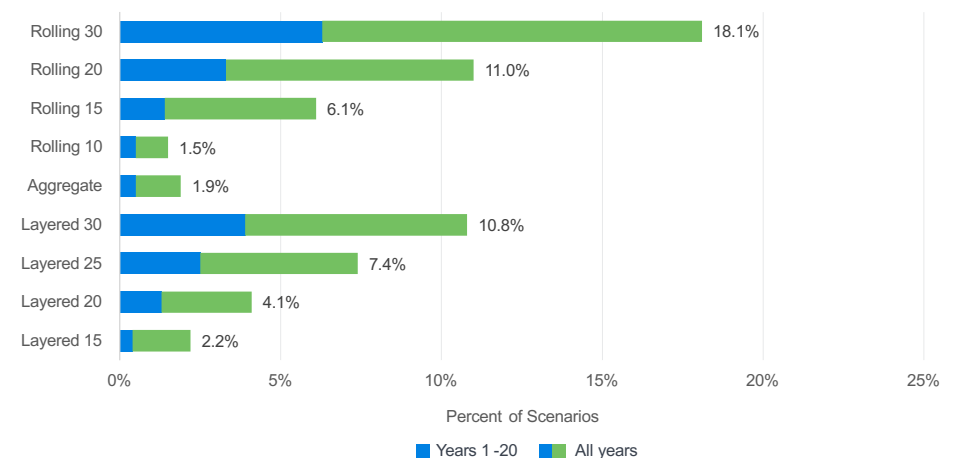
In addition to generational equity issues, low funding levels can be a pain point for plan sponsors for multiple reasons. First, a low funding level implies high (or increasing) levels of required contributions, which reduces the plan sponsor's ability

### PAIN POINTS FOR FUNDED RATIOS

The other side of the discussion is how many benefits those contributions pay for, as measured by how well they fund the promised plan benefits.

While plan sponsors' funding goals vary, for this article we consider a plan sponsor whose goal is to fund at 100%, with no cushion for adverse deviation. This implies that the amount of assets accumulated equals the present value of all future payments allocated to past service based on the actuarial assumptions. It is considered undesirable to have a low funded ratio, as it means that the

**FIGURE 10: MARKET VALUE OF ASSETS LESS THAN SIX TIMES THE ANNUAL BENEFIT PAYMENTS AT SOME POINT IN THE PROJECTION PERIOD**



**FIGURE 11: LESS THAN 60% FUNDED AT ANY TIME**

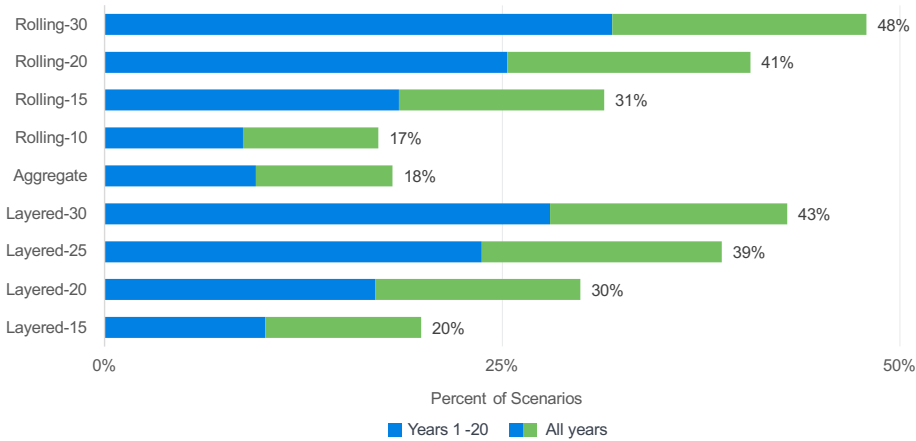
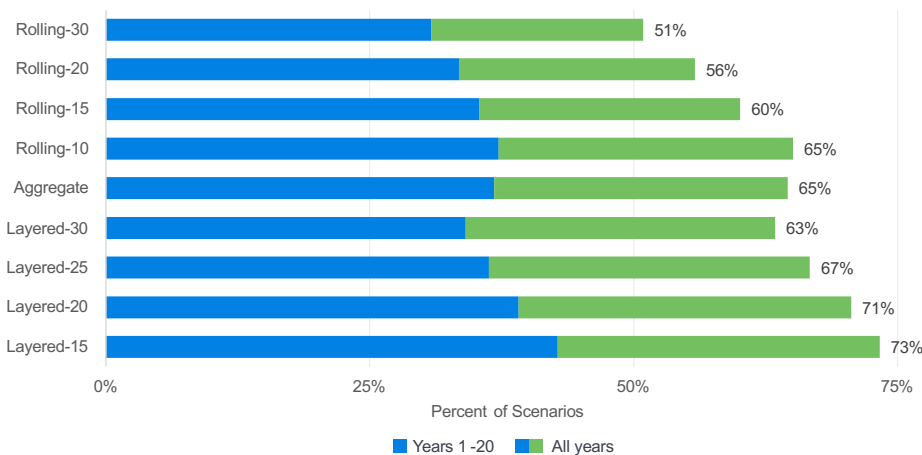


Figure 11 summarizes the percentage of modeled scenarios that drop below the pain point of a 60% funded ratio at some time during the 40-year horizon after starting with a 79% funded ratio.

Rolling-30 is almost three times as likely as Rolling-10 to be under 60% funded at some point in the projection period and crosses this pain point in nearly half of the scenarios. Stakeholders may question the choice of an amortization method with such a high probability of significant underfunding.

As you might expect, an amortization method that does well by avoiding the 60% funded pain point typically does poorly at avoiding the 30% employer contribution rate threshold in Figure 7. There are a couple of notable exceptions. Rolling-10 is the least likely of all scenarios to result in a funded ratio under 60%, yet it does significantly better than Layered-15 at avoiding the 30% employer contribution rate. In addition, it outperforms Layered-20 at avoiding a 60% funded ratio while having the same likelihood of requiring a 30% employer contribution rate.

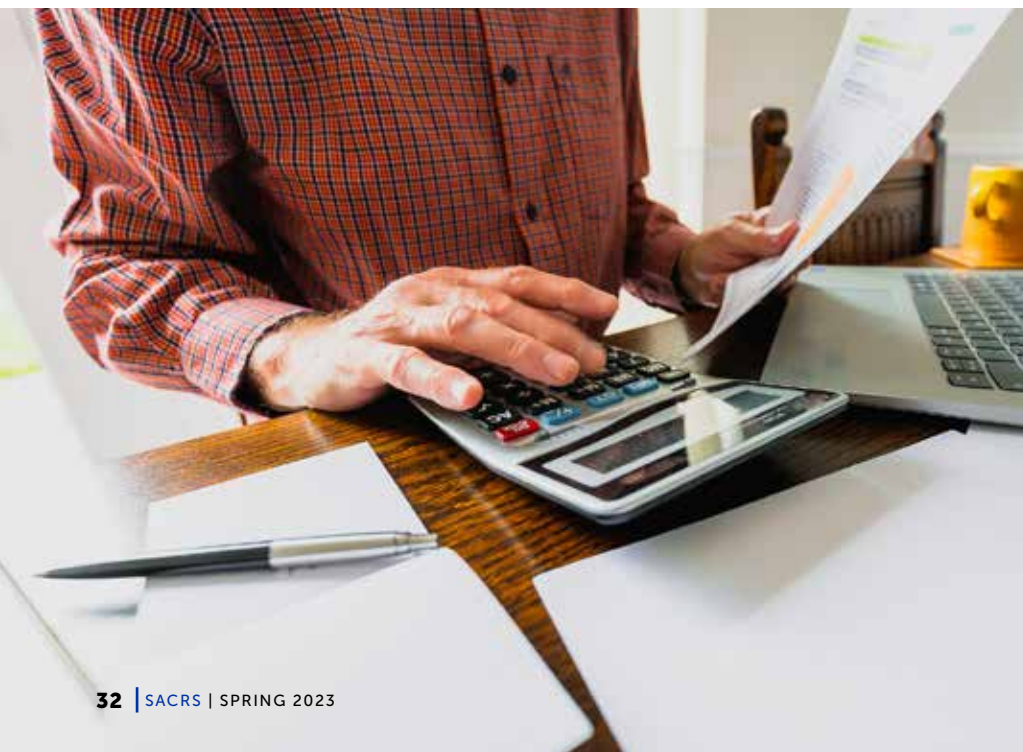
**FIGURE 12: OVER 120% FUNDED AT ANY TIME**



“Overfunding” can also be a concern. Because assets accumulate in a dedicated trust, excess assets cannot be returned to the plan sponsor until the system has no more members. In an overfunded situation, the plan sponsor cannot use the excess assets for other government purposes. Excess assets can be used to improve benefits or de-risk the plan. High funding levels may put pressure on a plan sponsor to increase benefits, which exposes them to larger risks during a financial downturn.<sup>1</sup> In our projections, we assumed that plan sponsors did not improve benefits or change the plan’s asset allocation to de-risk the portfolio.

Figure 12 summarizes the percentage of modeled scenarios that attain 120% funded at some time during the 40-year horizon. Note that, the larger the bars, the more likely it is that the plan will attain a funded ratio of 120%.

This pain point may actually be an opportunity as some plan sponsors would find this level of funding desirable and use





the opportunity to reduce investment risk. While this would likely reduce the funded ratio (the assumed discount rate is directly tied to the expected rate return on assets), the plan would be better able to weather market downturns. Other plan sponsors may prefer to increase benefits, which would also reduce the funded ratio, but adds more risk.

Figure 13 summarizes the percentage of modeled scenarios that fail to achieve 100% funded at any time during the 40-year horizon. The larger the bars, the more likely that the plan will fail to achieve a funded ratio of 100%.

In over 30% of the scenarios, Rolling-30 never attains 100% funded at any point during the 40-year projection period.

It is now clear why many plan sponsors are moving away from the once common Rolling-30 method even though it provides significant stability in contribution rates. These funded ratio pain points highlight the weakness of the Rolling-30 method as it produces the highest probability of painful underfunding and the lowest probability of hitting 100% or 120% funded. Stakeholders may question the prudence of an amortization method that struggles to meet the goal of a 100% funded ratio over a 40-year projection and that puts the ability of the plan to pay benefits at risk.

In comparison, Rolling-10 attains a 100% funded ratio in approximately 90% of scenarios, outperforming both Layered-30 and Layered-25. However, there is another consideration when setting an amortization policy, particularly when considering a rolling method. Under Governmental Accounting Standards Board (GASB) 67/68, there is a specific methodology for determining a "depletion date." Due to the GASB methodology, rolling amortizations are more likely to result in depletion dates than layered amortizations. A future article in this series will provide more detail about this calculation, including examples and some ideas to avoid having a depletion date.

### VOLATILITY OF FUNDED RATIOS

While we highlighted potential issues with overfunding above, it is important to note

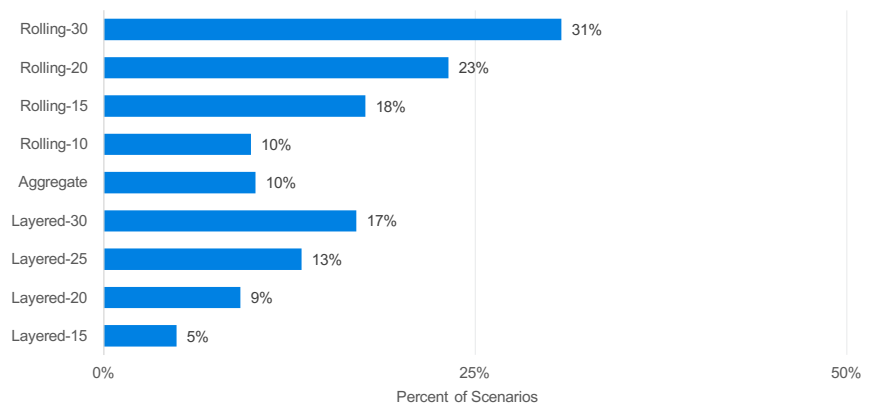
that achieving a positive goal for funding does not mean that there will not be a low funded ratio "pain point" in the future. One measure of the volatility in the funded ratios is how much fluctuation there is over time.

Figure 14 summarizes the percentage of modeled scenarios that cross these pain points at some time during the 40-year horizon. Note that the larger the bars, the more likely that a pain point will be hit.

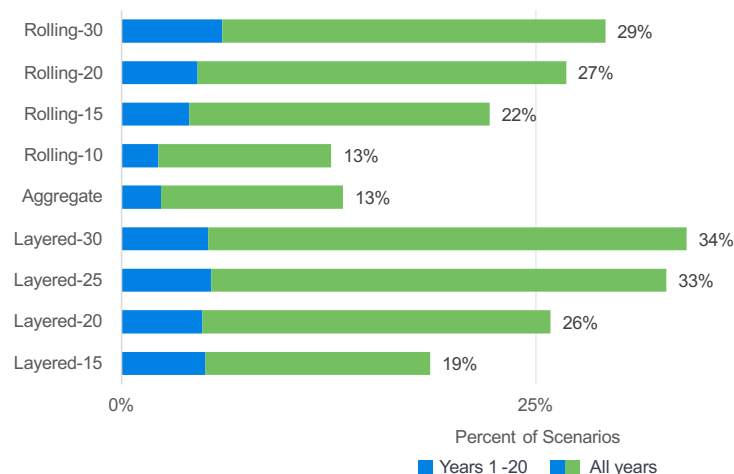
Figure 14 shows the percentage of scenarios which, after starting at 79% funded, both drop below 60% funded and achieve at least 100% funded at some point during the projection (not necessarily in that order). Under this measure of volatility, methods with longer amortization periods tend to be more volatile, compared to methods with shorter amortization periods.

**“ It is interesting to note that there is very little difference in the average contribution rates by length of amortization period when considering all 1,000 scenarios over 40 years. ”**

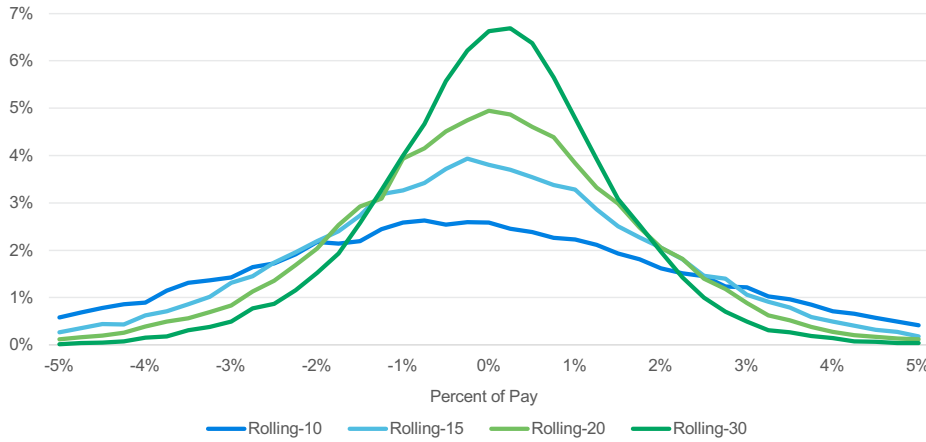
**FIGURE 13: FAILURE TO ACHIEVE 100% FUNDED AT ANY TIME**



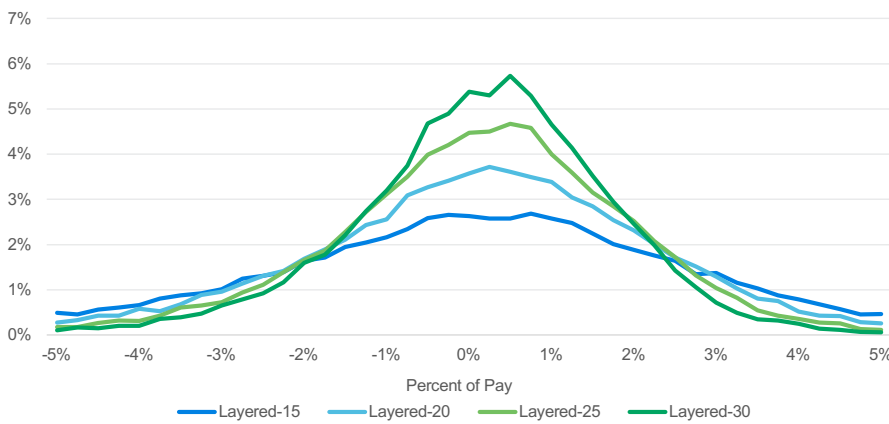
**FIGURE 14: BOTH DROP BELOW 60% AND ACHIEVE 100% FUNDED STATUS**



**FIGURE 15: ONE-YEAR CHANGE IN EMPLOYER CONTRIBUTIONS UNDER ROLLING METHODS**



**FIGURE 16: ONE-YEAR CHANGE IN EMPLOYER CONTRIBUTIONS UNDER LAYERED METHODS**



**FIGURE 17: ONE-YEAR CHANGE IN EMPLOYER CONTRIBUTIONS UNDER LAYERED-20 AND ROLLING-15**



## CONTRIBUTION RATE VOLATILITY BY ANOTHER METRIC

Another way to study contribution rate volatility is to look at the distribution of year-over-year changes in employer contribution rates as a percentage of pay. Figures 15 through 18 present the distributions of the 40,000 year-over-year changes from the 1,000 scenarios with 40 years in each scenario. The right-hand side of the graphs present the likelihood of increases in the contribution rates, with decreases on the left-hand side. Note that we have excluded the years that employer contributions remain unchanged at 0% in both one period and the next one.

As could be expected, the longer the amortization period, the more frequently there are small changes in the contribution rates. This is the reason long durations have higher peaks around zero and thinner tails.

Looking at the four different lengths studied for rolling amortizations, in Figure 15, we see similar likelihoods for changes of approximately 2%. However, the longer amortization periods (in green) have significantly more changes within 2%, and significant declines in frequency outside of that (thinner tails).

Figure 16 compares the one-year change in employer contributions for various layered amortizations. It is similar to the graph for rolling amortizations (Figure 15), although the peak around zero is not as high and the distribution is not as smooth. The peak is a little right of zero due to the fact that, if the employer contribution rate gets down to 0% then there can be an increase, but there are no decreases below zero. As shown in Figure 19, layered methods have more years of unchanged 0% contributions than rolling methods of a similar amortization length. However, they are also more likely to have more years with 4% or higher increases in employer contributions.

In Figure 17, we have compared the distributions for Rolling-15 and Layered-20 amortizations. This demonstrates that Rolling-15 and Layered-20 see very similar





distributions in terms of the annual change in contribution rates. Eventually, the Layered-20 amortization consists of layers that range in length from one to 20, while Rolling-15 has just one layer of length 15. Figure 17 shows more small declines for Rolling-15 than Layered-20. For Layered-20, it is worth noting that, due to the scale of Figures 15 to 18, the impact of the initial amortization charge being fully amortized 20 years after the first base is established is not shown. The loss of the initial base typically lowers employer contributions by more than 5% in year 21.

Figure 18 shows the one-year change in employer contribution rates under all methods.

In general, methods with longer amortization periods have more years with changes near 0% (a higher peak) and fewer years with large changes (thinner tails) when compared to methods with shorter amortization periods. Rolling methods have a smoother distribution of results than layered methods with similar amortization periods.

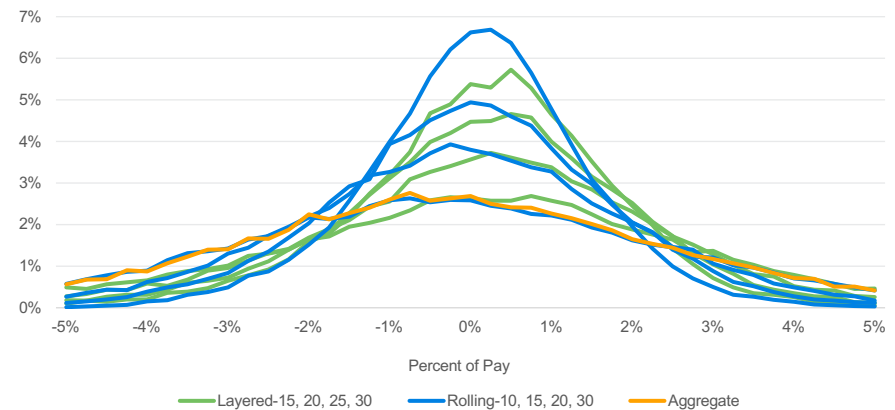
Figure 19 summarizes the absolute value of the one-year changes in employer contributions. Once again, this considers all 40,000 one-year changes based on 40 years and 1,000 scenarios. The green sections of the bars are for years where the employer contributions rates remain 0% in consecutive years. The orange and red sections are for increases over 2% and 4%, respectively. The methods with longer amortization periods are the least likely to have large year-to-year swings but are also

the least likely to be funded well enough to have results in the green bars.

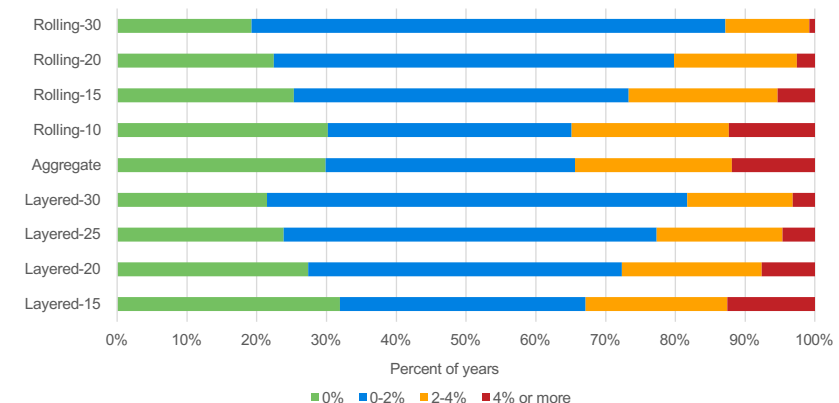
As mentioned, layered methods have more years of unchanged 0% contributions than

rolling methods of similar amortization lengths. However, it is worth noting they are also more likely to have more years with 4% or higher increases in employer contributions.

**FIGURE 18: ONE-YEAR CHANGE IN EMPLOYER CONTRIBUTIONS**



**FIGURE 19: ABSOLUTE VALUE OF A ONE-YEAR CHANGE IN EMPLOYER CONTRIBUTIONS**



**FIGURE 20: FUNDED RATIO AND EMPLOYER CONTRIBUTIONS**

	Layered-15	Layered-20	Layered-25	Layered-30	Aggregate	Rolling-10	Rolling-15	Rolling-20	Rolling-30
<b>Year 40 Funded Status</b>									
Median	114%	111%	107%	104%	108%	108%	103%	98%	90%
<b>40-year Average Employer Contributions</b>									
Median	11.4%	10.9%	10.7%	10.8%	10.7%	10.7%	10.5%	10.6%	10.4%
Average	11.9%	11.8%	11.7%	11.6%	11.5%	11.5%	11.3%	11.1%	10.8%

**COMBINING FUNDED RATIO AND AVERAGE CONTRIBUTION**

Figure 20 combines the median funded ratio with the average contribution rate over the 40-year projection. In general, both higher funded ratio and lower average contribution rates are preferable. Therefore, in general a method that is in the upper left corner would be preferable.

While low contribution rates under Rolling-30 translate to a low median funded ratio (90%) and the high contribution rates under Layered-15 translate to a higher median funded ratio (114%), higher contribution rates don't always lead to higher funded ratios.

For example, Rolling-15 and Rolling-20 have similar average contribution rates, yet Rolling-15 has a higher median funded ratio at the end of the projection period. Similarly, Layered-20 and Layered-30 also have consistent median contribution rates, but Layered-20 ends with a higher median funded ratio. Methods with shorter amortization periods are more reactive, and thus recover over a shorter period. As a result, when there are periods with high returns, these methods have more assets that increase, resulting in funded ratios exceeding 100%.

It is interesting to note that there is very little difference in the average contribution rates by length of amortization period when considering all 1,000 scenarios over 40 years. Within the family of layered contributions, the Layered-15 contribution averages 11.9% employer contributions, while the Layered-30 contribution averages 11.6%. There are higher initial contribution rates with the shorter amortization periods, but the

benefits need to be financed eventually, typically resulting in higher contributions in later years for the longer amortization periods. For perspective, we assume that employee contributions are 6% of pay, and that the total service cost averages 16.2% of pay.

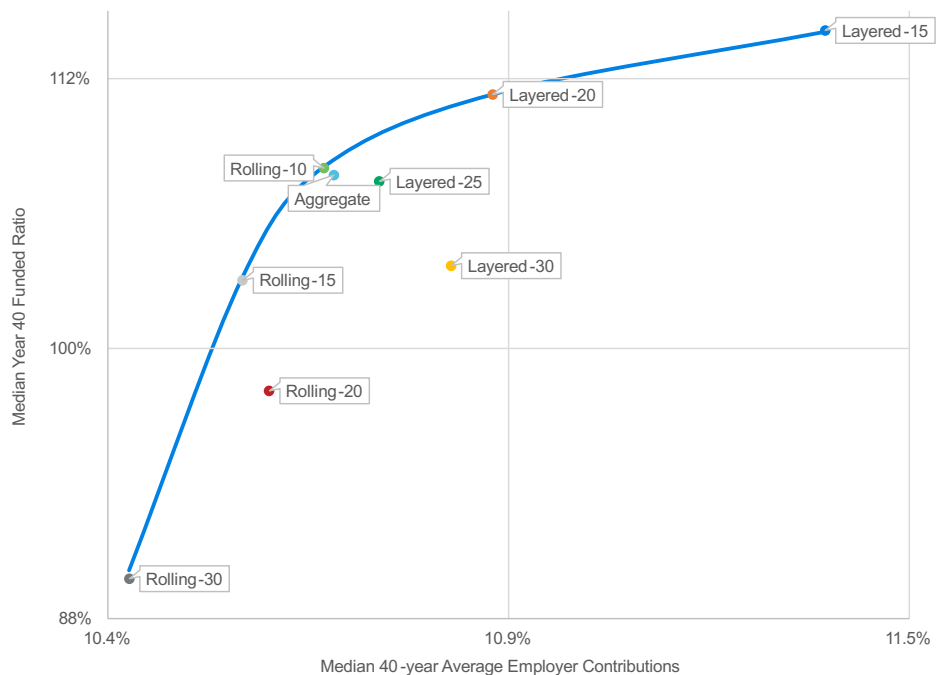
Despite the comparable levels of average contributions, shorter durations do result in higher median funded ratios after 40 years. The higher initial contributions, with lower contributions later, tend to fare better, as investment returns are greater than the increases in payroll in most scenarios.

The average contribution rates for the rolling amortization methods are lower than for the layered methods and the

median funded ratio after 40 years tends to be lower. As with the layered amortization methods, the average contribution rates vary little by amortization period within the family of rolling amortizations.

The Rolling-10 method results in lower average contribution levels than all of the layered amortization methods. Despite this, the median funded ratio after 40 years is actually a bit higher for this method than the Layered-25 and Layered-30 methods. The higher initial contribution rates are more than offset, on average, by lower contribution rates in later years. One potential downside of the Rolling-10 method compared to the layered amortizations of longer periods is the greater volatility from year to year.

**FIGURE 20: FUNDED RATIO AND EMPLOYER CONTRIBUTIONS (CONTINUED)**





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## CONCLUSION

Developing a funding policy is one of the most important decisions for a public plan sponsor. Unfortunately, balancing the needs of all stakeholders can also make it one of the most challenging. This article highlights the relative strengths and weaknesses of various amortization methods. Many of them are intuitive. For example, shorter amortization periods tend to be more responsive to market events, therefore they have more contribution volatility and a higher probability of reaching a contribution "pain point." All methods have similar average contribution rates, but methods with shorter amortization periods are the most likely to reach funding goals at the end of the projection period.

In the end, the choice of funding policy is a balance of stakeholder needs and each plan sponsor will need to make the best decision to meet these needs.

In our prior article, Public pension plan funding policy: Effectiveness of amortization methods under projected investment scenarios, we discussed the potential for counterintuitive results of layered amortization methods. In our next article, we will discuss a major challenge of rolling amortization methods, the GASB-defined "depletion date."

Future articles will examine how these amortization methods react to the situation where the expected return of assets used for setting the contribution rate overestimates actual underlying market expectations and we will expand the discussion of funding policies beyond simple amortization methods. We will explore adaptive policies that change amortization methods based on funded ratio, "sticky" contribution rates, and other variations.

## INDEX

1 As an example of how common benefit improvements are when funded ratios are high, we look back to the last time that funded ratios were as high as 120%, just before the 2000-2002 dot-com crash. Consider



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*findings of a survey conducted by the Wisconsin Legislative Council, entitled the "2002 Comparative Study of Major Public Retirement Systems." The report compared significant features of major state and local public employee retirement systems in the United States. The report considered retirement benefits provided to general employees and teachers. According to the survey, 30 of 85 plans increased their benefit multipliers between 2000 and 2002. In addition, 32 of the 85 plans studied increased their benefit multipliers between 1996 and 2000 (some appeared both times).*



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**Daniel Wade** is a principal at Milliman with 25 years of experience in the employee benefits field, serving primarily public sector clients. Wade is a Fellow of the Society of Actuaries and an enrolled actuary under ERISA. He earned a BS in Mathematics from Stanford University.



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**Arthur Rains-McNally** is a principal at Milliman with 20 years of experience in the employee benefits field, serving a wide variety of clients. He is a Fellow of the Society of Actuaries and an enrolled actuary under ERISA. He earned a MS in Mathematics from the University of Idaho.



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**Jessica Gardner** is a consulting actuary with nine years of experience serving public sector clients. Gardner is an Associate of the Society of Actuaries. She earned a BA from the University of Idaho.

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The authors are consulting actuaries in the West Region Employee Benefits practice of Milliman and members of the American Academy of Actuaries. Founded in 1947, Milliman is a premier global provider of actuarial and related products and services.

# PUBLIC PENSION PLAN FUNDING POLICY – PART THREE

## Appendix – Key methods, provisions, and assumptions

### PROJECTIONS

**Assets:** Assets are valued based on their fair value, with a five-year smoothing of all fair value gains and losses. The expected return is determined for each year based on the fair value at the beginning of the year and actual cash flows during the year. Any difference between the expected fair value return and the actual fair value return is recognized evenly over a period of five years.

Initial asset values are such that the funded ratio of the plan at the beginning of the projection period is 79%.

**Investment earnings:** Stochastic projections over the 40-year period were generated using a normal distribution, a 7.00% geometric average annual return, and a standard deviation of 12.00%. The equivalent average arithmetic return is 7.72%.

We generated 1,000 scenarios. The median annualized compound return over the 40-year period is 6.93%. The mean annualized compound return over the 40-year period is 7.00%.

**Actuarial cost method:** Liabilities are valued using the entry age actuarial cost method.

**Data:** The population is made up of 50% active members, 15% terminated vested members, and 35% retired and in-pay members. Within each status group, males and females are equally weighted by count.

The population is not assumed to grow or decline. Future members are assumed to have the same ages at entry and distribution by sex of the present members that they replace.

**Plan provisions:** Normal retirement benefits are equal to 2% of the highest consecutive three years of pay per year of service, up to 30 years. Normal retirement benefits are payable at age 65. Upon retirement, benefits increase annually at 2%.

Early retirement benefits and optional forms of benefits are actuarially equivalent to the normal form of payment.

### YEAR-OVER-YEAR RETURNS

We highlighted a single scenario. We ordered the scenarios from lowest to highest based on the annualized compound return over the 40-year period and defined the “median” as the 500th scenario. The returns by year under this scenario are in the table in Figure 21.

**FIGURE 21: 500TH (MEDIAN) SCENARIO RETURNS**

Mean return: 7.78%  
Annualized compound return: 6.93%

Year Return		Year Return		Year Return		Year Return	
1	12.65%	11	1.04%	21	2.09%	31	22.49%
2	15.98%	12	8.51%	22	-19.38%	32	18.76%
3	10.23%	13	3.47%	23	15.82%	33	7.19%
4	42.06%	14	-4.91%	24	-4.38%	34	20.98%
5	31.45%	15	-0.81%	25	-1.44%	35	11.14%
6	-8.53%	16	-18.65%	26	-6.82%	36	26.34%
7	-7.40%	17	1.00%	27	13.31%	37	6.95%
8	-2.44%	18	45.60%	28	5.91%	38	2.41%
9	15.19%	19	18.84%	29	-1.84%	39	1.47%
10	5.16%	20	-1.37%	30	11.54%	40	11.39%



## VALUATION ASSUMPTIONS

### Contributions

- **Member contributions:** Employee's contributions are 6% of pay annually, regardless of the funded ratio of the plan.
- **Employer contributions:** Service cost plus amortization of net pension liability (NPL) minus employee contributions, but not less than zero. Note that, for the aggregate actuarial cost method, the service cost is defined under that actuarial cost method and there is no component for the amortization of the NPL.

### DEMOGRAPHIC ASSUMPTIONS

- **Mortality:** PubG-2010 General Amount-Weighted Mortality Rates Projected with MP-2019.
- **Termination:** Service-based rates starting at 20% in the first year of service and grading to 1.5% at 22 or more years of service.
- **Retirement:** Rates vary by age and service based on retirement eligibility up to 100% at ages 70 or older.
- **Disability:** Age-based rates starting at 0% and grading to 0.1% at retirement eligibility.
- **Discount rate:** Based on a 7.0% annual investment return.
- **Projected payroll increases:** Total plan payroll increases by 3.0% per year. Individual members receive increases due to promotion and longevity.

### DEFINED TERMS

- **Actuarial value of assets:** The actuarial value of assets is a smoothed asset value, based on the market value of assets but recognizing gains and losses over five years
- **Amortization methods:** Closed, layered, and open/rolling.
  - **Closed amortization methods:** Under a closed amortization method, the entire net pension liability is amortized by a specific date. Each year after the actuarial valuation, the remaining number of years over which to pay the net pension liability decreases by one year.

- **Layered amortization methods:** Under the layered method, an additional layer of amortization is calculated each year based on the experience or assumption changes made that year. Each year the remaining number of years over which to pay each individual layer decreases by one year.

- **Rolling amortization methods:** Under a "rolling" method the amortization is reset annually based upon the entire net pension liability.

- **Contribution rates:** The percentage of salary contributed to pay for pension benefits. Typically, actuarially calculated contribution rates are comprised of two pieces. The first piece is equal to the service cost and the second is an amortization of the difference between the current funded ratio of the plan and the target funded ratio. The target funded ratio is usually 100%, the point where the net pension liability is zero, where the actuarial value of assets is equal to the total pension liability.

- **Funded ratio:** The ratio of the assets to the measured liabilities.

- **GASB:** Governmental Accounting Standards Board

- **Individual entry age actuarial cost method:** The individual entry age actuarial cost method assigns the expected cost of benefits to the years of service for each individual covered by the pension plan. This is the only actuarial cost method permissible for financial reporting under current standards of the GASB. Under this method, a service cost is calculated based on the percentage of pay required to fund contributions, if all actuarial assumptions were exactly realized from hire date until retirement date. The total pension liability is the share of the actuarial present value of benefits assigned to past service based on prior service costs.

- **Median:** The midpoint of a frequency distribution of observed values. The median value of a data set means that half of the values are larger and half are smaller than the median.

- **Stochastic modeling (Monte Carlo analysis):** "Stochastic testing" involves using a random number generator to perform a statistical analysis where 1,000 or more runs are created to test the likelihood of future events. This is also sometimes referred to as Monte Carlo analysis.

**STATE ASSOCIATION of  
COUNTY RETIREMENT SYSTEMS**

840 Richards Boulevard  
Sacramento, California 95811  
(916) 701-5158

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# UPCOMING CONFERENCE SCHEDULE

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## FALL 2023

**Nov. 7-10**

Omni Rancho Las Palmas Resort & Spa • Rancho Mirage, CA

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## SPRING 2024

**May 7-10**

Hilton Santa Barbara Beachfront Resort • Santa Barbara, CA

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## FALL 2024

**Nov. 12-15**

Hyatt Regency Hotel and Spa Monterey • Monterey, CA

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## SPRING 2025

**May 13-16**

Omni Rancho Las Palmas Resort & Spa • Rancho Mirage, CA

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## FALL 2025

**Nov. 11-14**

Napa Valley Marriott Hotel and Spa • Napa, CA

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## SPRING 2026

**May 12-15**

Resort at Squaw Creek • Olympic Valley, CA

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## FALL 2026

**Nov. 10-13**

Omni Rancho Las Palmas Resort & Spa • Rancho Mirage, CA

