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EXECUTIVE DIRECTOR REPORT
October 20, 2016

Activities	Updates
Trustee Elections	The deadline for receiving proposed candidate nominations was September 29, 2016. Lots will be drawn October 21 to determine where names will be placed on the ballot. Ballots will be mailed to qualified voters on October 31.
Budget and Audit Updates	As noted last month, budget materials have been provided to all DCRB departments regarding the FY 2018 budget development process. The process is moving along, and Finance has conducted budget planning meetings with department managers. The first draft of the FY 2018 budget will be presented to the Operations Committee in November. As also noted last month, CliftonLarsonAllen conducted an interim audit during the week of August 15, 2016. They presented their Audit Plan for the audit of FY 2016 to the Audit Committee earlier today. The audit will begin on November 14.
Actuarial Experience Study	Cavanaugh Macdonald has provided DCRB with preliminary information regarding the actuarial experience study covering the period from October 1, 2010 through September 30, 2015. It is expected that the results will be presented to the Board during its December meeting.
Visit by Australian Pension Board	On October 19, DCRB scheduled a meeting in its offices with members of the Australian State Super Fund to discuss mutually relevant issues surrounding pension funds management. Australia's pension system has total assets equating to nearly twice the Australian GDP.
Staffing Changes Since the Last Board Meeting	**Hires** **Sean Carver** joined the Benefits Department's Member Services Center on October 12, 2016. He has worked for the Department as a contractor since January 29, 2015. Sean earned a Certificate in Computer and Network Technology from the University of Maryland Baltimore County, and he has previous experience in document imaging and management.

Recent Retirement-Related Articles (attached)	"A Sour Surprise for Public Pensions: Two Sets of Books," Dealbook, The New York Times, Mary Williams Walsh, September 17, 2016. "An Examination of State Pension Performance: 2006 to 2015," Cliffwater, September 6, 2016. "Pensionomics 2016," National Institute on Retirement Security, Jennifer Erin Brown, September 2016. "U.S. State Pensions: Weak Market Returns Will Contribute To Rise In Expense," Ratings Direct, S&P Global Ratings, Susan S. Corson, September 12, 2016.

The New York Times http://nyti.ms/2cNqSBK

DealB%k WITH FOUNDER ANDREW ROSS SORKIN

A Sour Surprise for Public Pensions: Two Sets of Books

By MARY WILLIAMS WALSH SEPT. 17, 2016

When one of the tiniest pension funds imaginable — for Citrus Pest Control District No. 2, serving just six people in California — decided last year to convert itself to a 401(k) plan, it seemed like a no-brainer.

After all, the little fund held far more money than it needed, according to its official numbers from California's renowned public pension system, Calpers.

Except it really didn't.

In fact, it was significantly underfunded. Suddenly Calpers began demanding a payment of more than half a million dollars.

"My board was somewhat shocked," said Larry Houser, the general manager of the pest control district, whose workers tame the bugs and blights that threaten their corner of California citrus country. It is just a few miles down the road from Joshua Tree National Park.

It turns out that Calpers, which managed the little pension plan, keeps two sets of books: the officially stated numbers, and another set that reflects the "market

value" of the pensions that people have earned. The second number is not publicly disclosed. And it typically paints a much more troubling picture, according to people who follow the money.

The crisis at Citrus Pest Control District No. 2 illuminates a profound debate now sweeping the American public pension system. It is pitting specialist against specialist — this year in the rarefied confines of the American Academy of Actuaries, not far from the White House, the elite professionals who crunch pension numbers for a living came close to blows over this very issue.

But more important, it raises serious concerns that governments nationwide do not know the true condition of the pension funds they are responsible for. That exposes millions of people, including retired public workers, local taxpayers and municipal bond buyers — who are often retirees themselves — to risks they have no way of knowing about.

"One of the first things I think you should do is publish that number for every city," said William F. Sharpe, professor emeritus of finance at Stanford University's Graduate School of Business who won the Nobel in economic science in 1990 for his work on how the markets price financial instruments. He is also a California resident who voluntarily helped his city, Carmel-by-the-Sea, crack the secret pension code — figuring out the market value of its debt to its retirees in 2011 before Calpers resolved to start divulging the information later that year.

"We just about nailed it, which made us feel very good for ourselves — but very bad for the city," Professor Sharpe said. On a market basis, the city turned out to be $48 million short of what it owed retirees, or four times what the official numbers showed.

The two competing ways of valuing a pension fund are often called the actuarial approach (which is geared toward helping employers plan stable annual budgets, as opposed to measuring assets and liabilities), and the market approach, which reflects more hard-nosed math.

The market value of a pension reflects the full cost today of providing a steady, guaranteed income for life — and it's large. Alarmingly large, in fact. This is one

reason most states and cities don't let the market numbers see the light of day.

But in recent years, even the more modest actuarial numbers have been growing, as populations age and many public workers retire. In California, some struggling local governments now doubt they can really afford their pension plans, and have told Calpers they want out.

In response, Calpers has calculated the heretofore unknown market value of their pension promises — and told them that's the price of leaving, payable immediately. Few have that much cash, so it's welcome to the Hotel California: You can check out anytime you like, but you can never leave.

Calpers says it must bill departing governments for every penny their pensions could possibly cost because once they cash out, Calpers has no way of going back and getting more money from them if something goes wrong. Calpers keeps that money in a separate "termination pool."

Things went differently for Citrus Pest Control District No. 2. It withdrew first, before realizing the shortfall. Then, four months later, it got the unexpected bill from Calpers.

"I was opening the mail and thinking, 'Can this be right?' I thought they put an extra zero on it," said Tim Hoesterey, one of the district's two employees.

The bill came just as the district was building up a war chest to fight a virulent new citrus blight, a disease that had already devastated groves in Florida. The directors had armed themselves by raising a growers' tax per acre fivefold. Suddenly, paying Calpers would wipe out the whole citrus blight reserve.

Some wondered if they should just declare bankruptcy.

"There are people selling their farms, trying to get out of the business, because they can't make a profit anymore," Mr. Hoesterey said. He called Calpers to see if the district could get a break, an extended due date, or even stay with Calpers after all. Calpers said no. It was a done deal.

A Calpers spokeswoman, Amy Morgan, said such questions suggested "a misunderstanding of the purpose of Calpers."

"Calpers does not exist to make money," she said. "Calpers exists to fully pay out benefits that are promised to its members." She said the law required Calpers to perform a complete valuation after the termination date had passed, and to recover all the money needed to ensure that the retirees would be paid in full.

Today in California, both the market values and the actuarial pension values for many places are available on a website run by the Stanford Institute for Economic Policy Research. But for the 49 other states, the market numbers remain unknown.

The market-based numbers are "close to the truth of the liability," Professor Sharpe said. But most elected officials want the smaller numbers, and actuaries provide what their clients want. "Somebody just should have stopped this whole charade," he said.

For years, people have been trying to do just that. In 2003, the Society of Actuaries, a respected professional body, devoted most of its annual meeting to what was called "the Great Controversy" — the notion that the actuarial standards for pensions were fundamentally flawed, causing systemic underfunding and setting up a slow-moving train wreck when baby boomers retired. It drew a standing-room-only crowd.

The problem reaches far beyond pensions, and into the $3.7 trillion municipal bond market. The reason is that municipal bond ratings take into account the strength (or weakness) of government pension plans. If those numbers have been consistently wrong, as dissidents argued, then actuaries were helping mislead the investors buying municipal bonds.

Arguably, the flawed standards worsened the problem with each passing year: Actuarial values determine the annual contributions that states and local governments make to their pension plans, so if the target numbers are too low, the contributions will always be too small. Shortfalls will be compounding, invisibly.

Much of the debate surrounded the routine practice of translating future pension payments into today's dollars, which is called discounting. The tiny pension plan at Citrus Pest Control District No. 2 shows clearly what the problem is.

With everybody either retired, or about to be (Mr. Houser will retire later this year), there is no guesswork in determining everybody's pensions. The actuaries at Calpers project each of the future monthly payments due to Mr. Houser and the other five retirees, assuming they will live to age 90. (Mr. Hoesterey is not included because his retirement benefit is the new 401(k) plan.) Then, they translate all those future payments into today's dollars with a rate — often called a discount rate. This is exactly how a lender would calculate a home mortgage.

The problem is, which rate should be used? An economist would say the right rate for Calpers is the one for a risk-free bond, like a Treasury bond, because public pensions in California are guaranteed by the state and therefore risk-free. And that's what Calpers does when it calculates market values. It used 2.56 percent when it calculated the bill for the pest control district, producing a $447,000 shortfall.

But the rest of the time, Calpers and virtually all other public pension funds use their assumed annual rate of return on assets, now generally around 7.5 percent. Presto: This makes a pension appear to have a much smaller liability — or even a surplus.

That was the case with the pest control district for years. And since there seemed to be a surplus, Calpers said the district owed no annual contributions. Calpers's numbers hid it, but the six members' pensions were going unfunded.

"Every economist who has looked at this has said, 'It's crazy to use what you expect to earn on assets to discount a guaranteed promise you have made. That's nuts!'" Professor Sharpe said.

But what he calls crazy is enshrined in the actuarial standards. And since adhering to the standards makes public pensions look affordable, there is a powerful incentive to preserve those standards.

"Actuaries shamelessly, although often in good faith, understate pension obligations by as much as 50 percent," said Jeremy Gold, an actuary and economist, in a speech last year at the M.I.T. Center for Finance and Policy. "Their clients want them to."

Mr. Gold was also a ringleader of that stormy professional meeting in 2003. Since then, there have been more conferences, monographs, speeches, blue-ribbon panels and recommendations — to say nothing of an unusual spate of municipal bankruptcies and insolvencies in which ailing pension plans have played starring roles. And yet little has changed.

Even as Citrus Pest Control District No. 2 was scrambling to find the cash to pay its unexpected bill this year, another fight broke out within the American Academy of Actuaries, which represents the profession in Washington, over the same issues.

An academy task force had commissioned a paper on how financial economists would measure public pensions. But during the peer review process, the opus was spiked, the task force disbanded and the four authors — Mr. Gold among them — barred from publishing the work elsewhere.

Accusations of censorship flew. The four authors said the academy's copyright claims were false. The academy's president, Thomas F. Wildsmith IV, said in a statement to members on the academy's website that the paper "could not meet the academy's publication standards."

In a separate email message to The New York Times he said the academy was committed to helping the public understand the different measurements, and provided a position paper concluding that both measures are useful, but for different purposes.

Then the Society of Actuaries, which handles the education and testing of actuaries, joined the fray. It posted the suppressed paper on its own website, albeit with the authors' names removed. It claimed to hold the copyright jointly with the academy. It also added a statement that the paper did not reflect the position "of any group that speaks for the profession" but called the authors "knowledgeable."

The society's president, Craig W. Reynolds, sent an email message citing other efforts "to develop strong funding programs that are responsive to a rapidly changing environment."

The four authors then issued a revised version of their paper, with their names on the front — and a claim that they held the copyright. The paper, which runs 19 pages, says in brief: Use market values for public pensions.

Professor Sharpe noted that Calpers's market-based method was "virtually the precise approach advocated in this paper."

Almost, but not entirely.

At Citrus Pest Control District No. 2, Mr. Hoesterey said Calpers added a final twist. It took so long to calculate the district's final payment that the bill arrived four months after the district's withdrawal date — and then it charged four months' interest, at 7.5 percent, on the late payment.

Ms. Morgan, the spokeswoman, said the four-month lag was "unfortunate but unavoidable."

Mr. Hoesterey said Calpers should have warned the district well in advance how big the bill might be, to give it time to find the money. "I kept asking: 'Does this seem fair to you? What other organization conducts business like this?'" he said.

Seeing no way out, the district paid the whole thing.

A version of this article appears in print on September 18, 2016, on page BU1 of the New York edition with the headline: A Sour Surprise for Public Pensions.

CLIFFWATER LLC

An Examination of State Pension Performance: 2006 to 2015

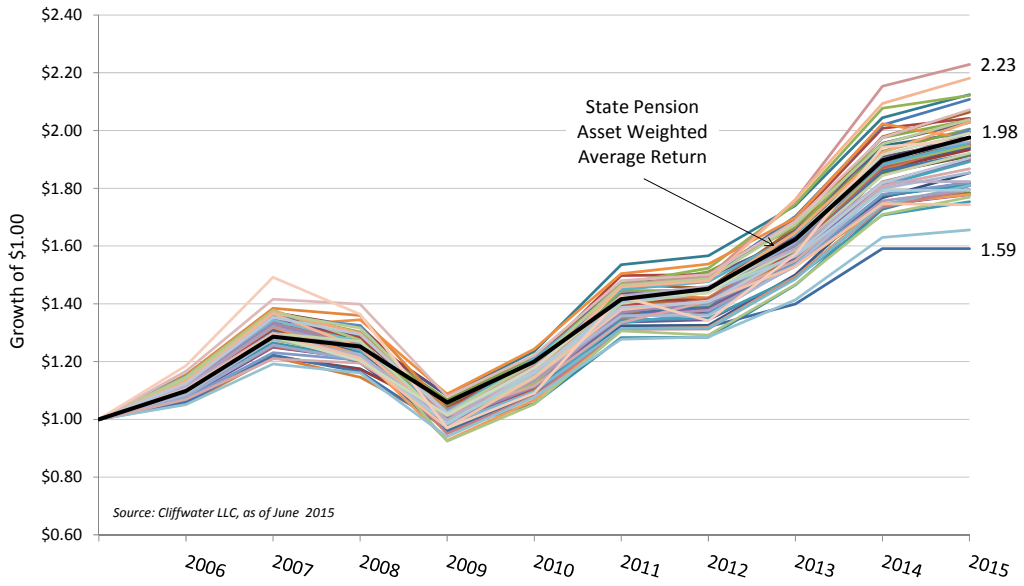
September 6, 2016

Most state pensions are under intense public scrutiny due to budgetary pressures from large and growing contributions necessary to correct underfunding. The causes and cures for pension underfunding are multidimensional and often contested. This report focuses on the management of state pension assets, an important but not well understood aspect of pension funding.

While capital markets largely drove returns for state pensions, we find a wide range of 10-year return outcomes among state pensions, most of which is attributable to implementation (fund/manager selection) rather than differences in asset allocation. We find that fund/manager selection by state pensions, in aggregate, has been accretive to return over the study period.

We conclude that the role of investments in helping solve pension underfunding will largely be determined by the future health of the capital markets, particularly for equity securities. We show that, overall, state pensions continue to take advantage of what the capital markets offer in returns, and the importance of individual state policy and manager decisions that can significantly contribute to return outcomes.

Exhibit 1: 10-Year Cumulative State Pension Returns: FY2006 to FY2015



Study Data

We draw our findings from data and descriptive narrative provided in the Comprehensive Annual Financial Reports ("CAFRs") published by state pension systems. We select this data source because, unlike commonly used commercial universes, it is a closed group with no selection biases, and represents results for large institutional investors. At the same time, our data shares two weaknesses found in other universe comparisons.

First, state pensions are not consistent in their reporting of fees. Most of the performance measurement industry still reports returns before investment fees, and consequently some fraction of returns presented in this report is before fees. This is certainly true for public stock and bond asset classes, where approximately one-quarter of states report returns net-of-fees, one-quarter report gross-of-fees, and one-half make no mention of whether returns are net or gross. Our strong suspicion is that where the treatment of fees is not reported, returns are gross-of-fees.

An exception is alternative investments (private real assets, real estate, private equity, and hedge funds) where returns are almost always reported net-of-fees. This is because either they are based on cash flows where fees are already netted or, in the case of hedge funds, performance is calculated on Net Asset Value ("NAV") from the fund administrator where fees are always deducted.

As a consequence of the industry's inconsistency in the netting of fees, our results should be viewed as a mix of net and gross returns where traditional asset classes generally, but not always, will be reported gross-of-fees and alternative asset classes almost always reported net-of-fees.

Key Findings:

1. State pensions collectively earned a **6.8% median** annualized return[1] over the **10 years ended June 30, 2015**, but underperformed their 8.0% median actuarial interest rate assumption for the same period.
2. **Two-thirds of state pension returns exceeded a 6.5% return for a passive 65/35 mix** of stock and bond index funds.[2]
3. The 6.8% median state pension return fell within a **wide 4.8% to 8.4% range** of individual state returns, with the **top performing state plan outperforming the bottom performing state plan by a cumulative 63.8% over 10 years**, demonstrating the potential for significant financial consequences underlying investment policy and implementation decisions.
4. State pension returns were volatile year to year, with **a median standard deviation of return equal to 12.7%**. Standard deviations for individual state pensions ranged from a low of 9.9% to a high of 15.6%. By comparison, standard deviations for global equities and U.S. bonds were 18.7% and 3.5%, respectively.
5. **We find that differences in 10-year state pension returns had only a small relationship to risk taking**, as measured by standard deviation, with a 0.14 correlation and accounting for only 0.3% of the 3.6% range in 10 year state pension returns.[3] This implies that 3.3% of the 3.6% 10 year return range was attributable to implementation decisions of individual state pensions.
6. **Aggregate asset allocation remained unchanged** from the prior year, with state pension assets averaging 50% to public equities, 26% to fixed income (including

[1] Average and asset-weighted 10-year state pension returns were both 6.7%.
[2] A mix of 65% global stocks represented by the MSCI ACWI Index and 35% bonds represented by the Barclays Aggregate Bond Index.
[3] The same is true if risk is measured by equity beta.

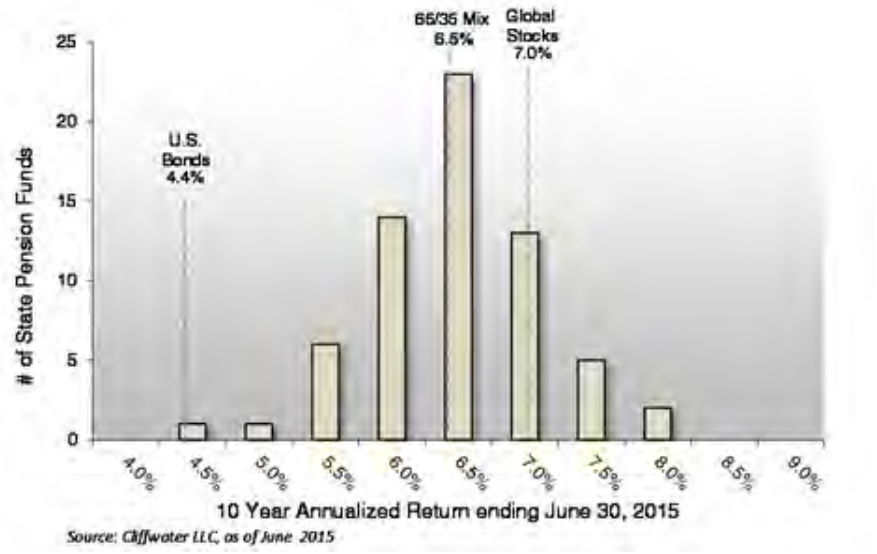
cash), and 24% to alternative investments. The last two fiscal years reflect stability in asset allocation that had seen public equity allocations decline from 61% in 2006.

7. **Private equity continues its history of providing the highest asset class returns**, with an 11.9% median return over the 10-year study period.
8. **State pension real estate returns vary widely over the 10-year study period** with a 6.6% median return falling below the 6.8% median state pension total fund return. Differences in how state pensions allocate within real estate explain the wide 5.8% range in individual state pension real estate outcomes over the 10-year study period and should be an area of greater attention by allocators.
9. **Risk-adjusted returns for state pensions were largely neutral with respect to hedge fund allocations.** State pensions with hedge fund allocations experienced, on average, lower return and lower risk over the 10 year period.
10. State pensions **outperform professionally managed defined contribution plan returns** by 0.8% annually over the last 10 years.

10-Year State Pension Performance

Exhibit 2 shows the distribution of 10 year annualized returns for 64 state pension systems reporting returns through June 30, 2015, which represents their fiscal year-end.[4]

Exhibit 2: Ten Year State Pension Performance



Returns range from 4.8% to 8.4% with a 6.8% median return. Also shown in Exhibit 2 is the return that would have been earned from a passive 65/35 "buy and hold" mix of stocks and bonds. Importantly, most state pensions were able to earn higher returns through diversification into alternatives and other forms of active management.

Exhibit 3 displays the percentile distribution of state pension returns over the 10 year period. While the differences might to some appear small, they represent a very large dollar value when compounded over 10 years. For example, a $17 billion state pension – the current median asset

[4] Twenty-eight state-wide funds are excluded because their fiscal years do not end on June 30.

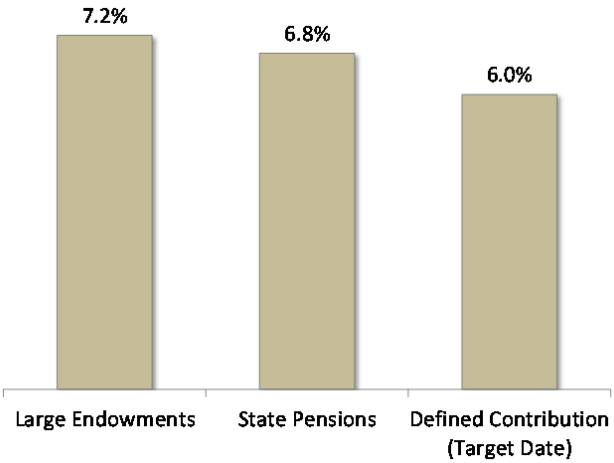
size – would grow to $29 billion by earning 8.4% annually for 10 years but only $21 billion by earning 4.8%.[5] This $8 billion difference represents the potential upside/downside from investment decisions made by staff, advisors, and trustees, in addition to the broader stock/bond allocation decision.

Exhibit 3: Quartile Ten Year State Pension Returns
(Ended June 30, 2015)

	Return	Growth of $1.00
Highest	8.35%	$2.23
First Quartile Return	7.13%	$1.99
Median Return	6.84%	$1.94
Third Quartile Return	6.18%	$1.82
Lowest	4.75%	$1.59
Asset Weighted	6.74%	$1.92

Exhibit 4 compares state pension returns over the last 10 years with two other types of long term capital: large endowments[6] and professionally managed defined contribution plans (e.g. target date funds[7]).

Exhibit 4: Median Ten Year Returns by Fund Type
(Ended June 30, 2015)



Larger endowments continue to outperform state pensions, with a median return of 7.2% over the past 10 years. Likely reasons for the 0.4% difference with state pensions are their higher allocation to alternative investments and possibly superior access to favorable investments and managers, though we have no data to support that possibility. We note that the difference in returns has been shrinking in recent years.

On the other hand, state pensions outperformed defined contribution plans over our 10 year study period, measured by the median performance of 57 target date funds. This positive difference supports a public policy view that defined benefit plans provide a lower cost (higher return) path to retirement security when compared to defined contribution plans. We do not have data on

[5] We assume a net 2.7% payout rate, equal to the average state pension experience over the last 10 years.
[6] Our sample consists of 78 endowments with assets greater than $1 billion and totaling $310 billion in assets. (Source: NACUBO/Commonfund)
[7] Our sample consists of 57 target date funds with 10 year track records totaling $331 billion in assets and spanning 2020/25/30/35/40/45/50 target retirement dates. (Source: eVestment)

self-directed defined contribution performance but other studies suggest that average investor returns are very low due to the "buy high, sell low" behavior of retail investors. [8, 9]

Return and Risk

General stock and bond movements drive state pension performance for any individual fiscal year, as illustrated in Exhibit 5.

Exhibit 5: State Pension Return Distributions for Years 2006 to 2015,
And 10-Year Annualized Returns

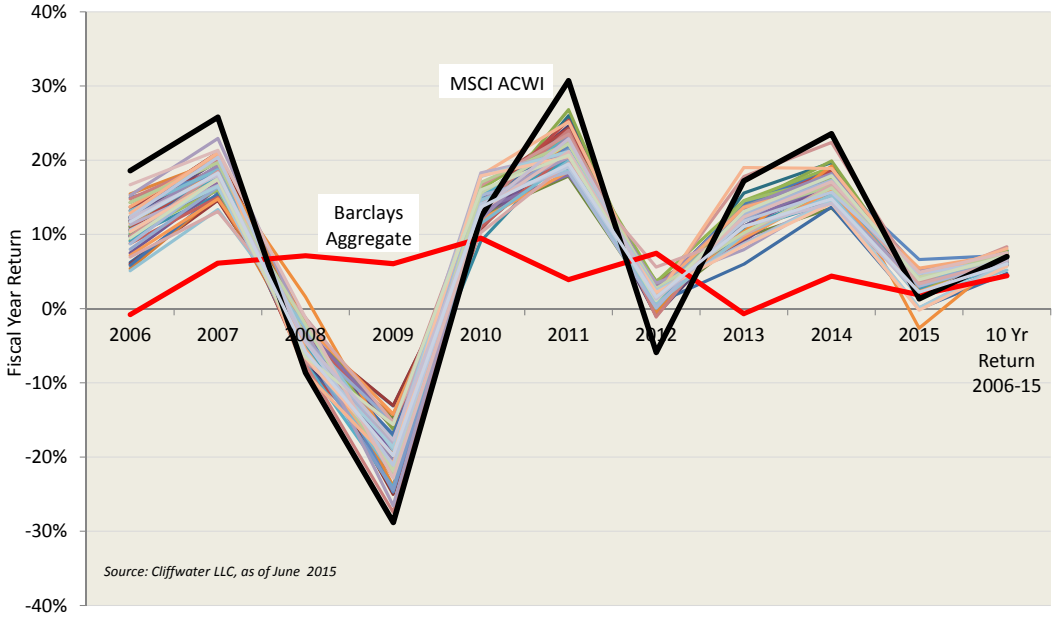


Exhibit 5 plots fiscal year-to-year returns for each of the 64 state pensions, ending with 10-year annualized return. Each line represents one state pension. Also shown are fiscal year returns for global stocks (MSCI ACWI Index) and U.S. bonds (Barclays Aggregate Bond Index).

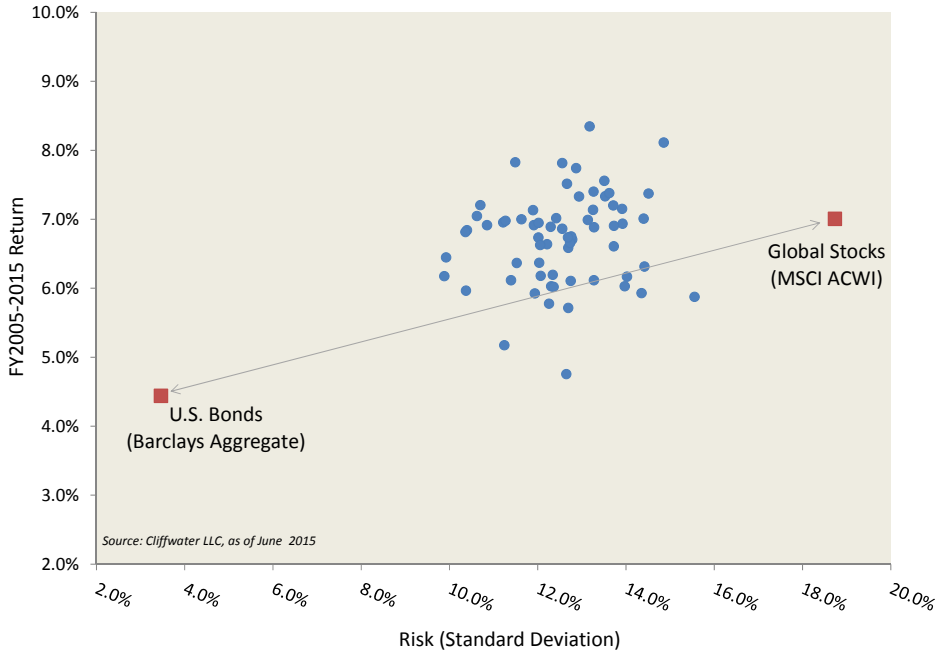
Exhibit 5 illustrates the importance of stock price movements on individual fiscal year state pension returns and also suggests that most of the volatility in state pension assets is equity related. Also impressive is the high short term correlation among individual state pension returns.

Ten year returns are plotted at the far right in Exhibit 5. The ups and downs of individual years are offset to achieve longer term returns more in line with expectations. Notice also that while state pension returns for individual years appear well bounded and largely explained by general stock and bond returns, over a longer 10 year period differences in state pension returns are less impacted by differences in overall risk-taking.

Exhibit 6 focuses only on 10 year state pension returns and their differences. Each dot in Exhibit 6 represents the annualized return and risk (standard deviation) of a state pension for the 10 year study period.[10] As in Exhibit 5, there are 64 state pensions represented.

[8] Dalbar 2013 Quantitative Analysis of Investor Behavior (QAIB)
[9] See, for example, Stephen L. Nesbitt, "Buy High, Sell Low: Timing Errors in Mutual Fund Allocations," in Journal of Portfolio Management, Fall 1995.
[10] Standard deviation is calculated based upon 10 fiscal year returns.

Exhibit 6: State Pension Return and Risk, FY2006 to FY2015



Individual state pension return and risk is fairly tightly clustered, particularly in relation to the stock and bond indices, also plotted in Exhibit 6. This is consistent with the yearly return pattern in Exhibit 5 and suggests that those responsible for state pensions share investment philosophies that have more in common than not. For example, while differences exist on allocations to international stocks, alternatives, and high yield bonds, etc., no state pension appears to have broken convention and implemented truly differentiated high or low risk portfolios. However, Exhibit 6 does reveal significant differences in 10 year outcomes that are not attributable to the level of portfolio risk, at least not risk measured by standard deviation. In fact, the correlation between state pension return and risk is only 0.14 for the 10 year study period.

Risk-taking has an important impact on the overall absolute level of state fund returns and individual fiscal year returns, but has a much smaller role in explaining differences among state pension returns over longer 10 year periods.

Asset Allocation

Most pension boards and staffs are fully aware of the investment challenges ahead and began gradually shifting their asset allocation strategies. The increased use of alternative investments – including private equity, private real estate, hedge funds, and real assets – has been the most pronounced change over the last 10 years. But, as Exhibit 7 shows, state pension allocations to alternatives began to level off in 2012 at 24% of total assets. [11]

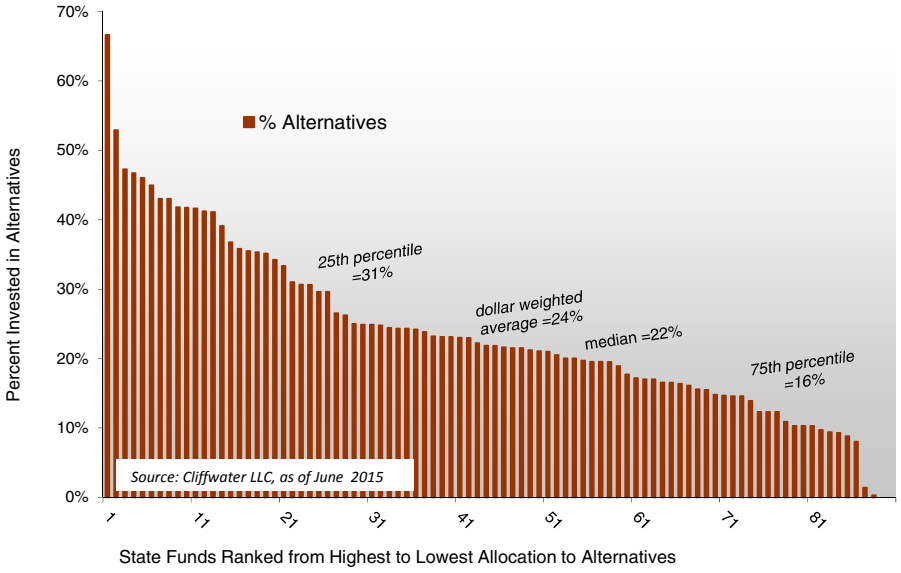
[11] Asset allocation data is based upon an expanded list of 93 state pension systems, including those whose fiscal 2015 end is not June 30.

Exhibit 7: Changes to Overall State Pension Asset Allocation (asset-weighted)

	2006	2011	2012	2013	2014	2015	YoY Change
Public Equities	61%	51%	49%	50%	51%	50%	-1%
Fixed Income	26%	25%	25%	22%	23%	23%	0%
Alternatives	10%	21%	24%	25%	24%	24%	0%
Cash	2%	3%	2%	3%	2%	3%	1%
Total	100%	100%	100%	100%	100%	100%	

Individual state pension allocations to alternatives vary widely, as shown in Exhibit 8, which orders alternatives allocations from highest to lowest across the 93 state pension plans.

Exhibit 8: Distribution of 2015 Alternative Allocations among State Pensions



The median allocation to alternatives equaled 22% as of June 30, 2015. The dollar-weighted average allocation equaled 24% of total assets.

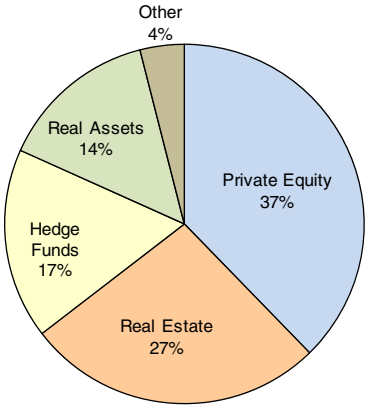
Alternatives allocations ranged from 0% for two of the 93 state pension systems reporting, to a high of 67%.[12] There is also considerable difference in allocations among systems ranking in the middle 50%. The 75th percentile allocation to alternatives equaled 16% of assets, up from 15% last year. The 25th percentile allocation equaled 31% of assets, the same as last year.

In a few instances the difference in allocations is due to statutory restrictions. Some state pensions only recently were given the latitude to invest in alternatives. This includes the Georgia pension systems, which reported no allocation to alternatives. Those state pensions with higher alternative allocations can also differ in how they invest. Some, like Michigan, Oregon, and Washington, invest primarily in private equity and real estate. Others, like Missouri, Utah, and South Carolina, tilt their alternatives allocations toward hedge funds. These differences in the composition of alternatives could be caused by a number of factors, including the intended role of alternatives within the overall asset allocation plan or staff/consultant expertise.

[12] Georgia Teachers and Oklahoma PERS have no alternative investments while Missouri State Employees (MOSERS) reports a 67% allocation to alternatives.

Exhibit 9 shows the average composition of alternatives for state pensions across private equity, real estate, hedge funds, real assets, and other alternatives. Private equity is the largest alternative asset class, representing 37% of total alternatives. Real estate is second at 27% of alternatives. Hedge funds and real assets follow, equaling 17% and 14%, respectively, of the alternatives pie.

Exhibit 9: State Pension Allocations to Alternative Assets, Fiscal 2015



	Assets ($ bil)	% of Total Assets	% of Alternative Assets
Private Equity	$273	9%	37%
Real Estate	$194	6%	27%
Hedge Funds	$124	4%	17%
Real Assets	$103	3%	14%
Other Alts	$29	1%	4%
	$722	24%	100%

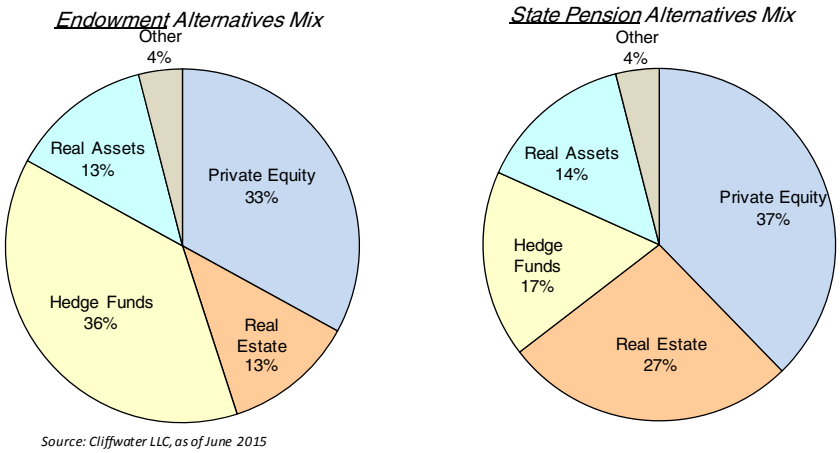
Source: Cliffwater LLC, as of June 2015

Comparison to Endowments

State pensions have been shifting their asset allocation toward what is referred to as the "endowment model." Endowments have historically had higher allocations to alternatives. In contrast to the 24% average state pension allocation to alternatives, endowments reported an average alternatives allocation equal to 51% of assets on June 30, 2015.[13]

The composition of alternatives within state pensions also differs from endowments, as shown in Exhibit 10. Hedge funds represent a much larger 36% fraction of the endowment alternative asset pie compared to 17% for state pensions. Offsetting the lower allocation to hedge funds for state pensions is a much higher allocation to real estate. Real estate represents 27% of alternative allocations for state pensions versus 13% for large endowments.

Exhibit 10: Composition of Alternative Investments for Fiscal 2015



Source: Cliffwater LLC, as of June 2015

[13] Source: NACUBO/Commonfund

The higher endowment allocation to alternatives likely explains their better performance over the last decade compared to state pensions. Another factor could be access to superior performing asset managers, though we have no data to support that possibility.

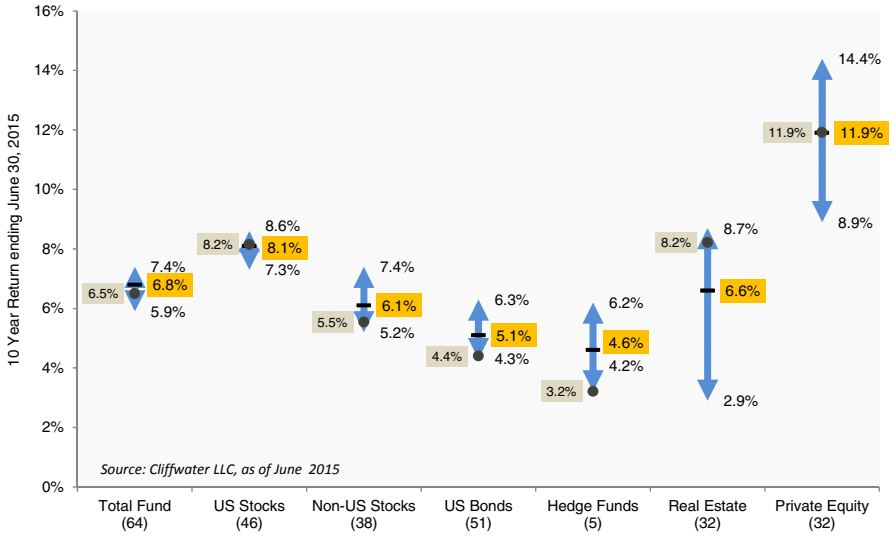
State Pension Performance within Asset Classes

Exhibit 11 reports the distribution of 10 year asset class returns for state pensions with fiscal years ended June 30, 2015.

Six major asset classes are represented together with total fund returns, matching those shown in Exhibit 2. Not all 64 state pensions that reported 10 year total fund returns ended June 30, 2015 also reported all asset class returns. We display the number of state funds represented in each asset class distribution below the asset class labels along the horizontal axis. We believe that the omission of states that either do not have June 30 fiscal year-ends or those who do not report asset class returns – either because they did not invest for the entire 10 year period or chose not to report – does not materially detract from our findings.

The arrows in Exhibit 11 display the range of individual state pension returns from low (the 95th percentile return) to high (the 5th percentile return) along with their values. Median returns are shown in gold on the right with a dash mark depicting where in the arrow the value falls. Commonly used benchmark returns – see Exhibit 12 for a listing – are identified as dots, with values shown in gray to the left.[14]

Exhibit 11: 5th to 95th Percentile Distribution of State Fund Returns
(10 Years ended June 30, 2015)



The return distribution for U.S. stocks is narrow, reflecting the wide use of indexing by state pensions and the active risk diversification brought by using multiple managers which individually are also diversified. The wider spread of returns for U.S. bonds and non-U.S. stocks is principally due to differing sub-allocations to high yield bonds and emerging markets, respectively.

Ten year private equity and real estate returns are widely distributed. This suggests that implementation is much more important for alternative investments, and results can vary significantly from benchmark returns. The median return for real estate (6.6%) and especially

[14] We use the 10 year return for a 65%/35% mix of global stocks (MSCI ACWI) and U.S. bonds (Barclays Aggregate Bond Index)

private equity (11.9%) reflect attractive 10 year outcomes. However, differences in implementation (portfolio structure and manager selection) proved to be very important for individual state pension returns in both of these asset classes.

We add the distribution of reported 10 year hedge fund returns for the first time, though the total number of state pensions reporting is low. The return distribution is wide, like real estate and private equity, showing the importance of implementation. The 4.6% median return for the asset class fell below the 5.1% median return for U.S. bonds, but did outperform the 3.2% HFRI Fund-of-Funds Index return and the 4.4% Barclays Aggregate Bond Index return.

These findings suggest that those responsible for investing state fund assets need to recognize that investment strategy and selection within alternative asset classes is as important as the amounts allocated to these asset classes. Unlike publicly traded stocks and bonds where implementation/selection risk can be minimized by investing in a low cost and diversified index fund, alternative asset classes offer no investible index and deliver higher or lower returns depending upon the ability to select the best managers and strategies.

Performance versus Benchmarks

The capacity to earn excess returns in traditional asset classes has been a challenge for investors for many years, including state pension funds. Exhibit 12 subtracts commonly used benchmark returns from asset class total returns reported in Exhibit 11. These return differences measure the success state pensions have had in adding value within asset classes over standard industry-wide benchmark index returns.

Exhibit 12: Distribution of Excess Returns for 10 Years ended June 30, 2015

	U.S. Stocks	Non-U.S. Stocks	Fixed Income	Hedge Funds	Real Estate	Private Equity
Top Decile	0.4%	1.9%	1.9%	2.5%	0.5%	2.5%
1st Quartile	0.2%	1.3%	1.2%	1.7%	-0.4%	0.9%
Median	-0.1%	0.6%	0.7%	1.4%	-1.7%	0.0%
3rd Quartile	-0.4%	0.1%	0.3%	1.0%	-3.1%	-1.4%
Bottom Decile	-0.9%	-0.4%	-0.1%	1.0%	-5.3%	-3.0%

Benchmarks:	US Stocks:	Russell 3000 Index
	Non-US Stocks:	MSCI ACWI ex US Index
	Fixed Income:	Barclays Aggregate Index
	Hedge Funds:	HFRI Fund-of-Funds Index
	Real Estate:	NCREIF Property Index
	Private Equity:	Cambridge Private Equity

State pensions showed mixed results in their ability to exceed U.S. stock benchmark returns over the 10-year study period. Median excess returns centered near zero, with asymmetrical upside and downside excess returns. These results suggest that traditional (i.e. long only) active management within publicly traded U.S. stocks should be reconsidered by state pensions before embracing the often time-consuming process typically associated with selecting active managers in these more efficient asset classes.

Fixed income excess returns were attractive over the 10 year period, especially when juxtaposed to U.S. stock excess returns. Credit risk and duration risk relative to the Barclays Aggregate Bond Index were both rewarded over the 10 years, explaining much of the positive fixed income excess return achieved by state funds. This outcome can prove to be short lived if credit spreads widen and/or interest rates rise. Our findings suggest that producing excess return within fixed

income will be heavily influenced by the manager's assessment of the timing and direction of changes in credit spreads and interest rates, both of which have been unpredictable.

Private Real Estate

Real estate experienced little growth – measured as a percentage of total pension assets – over the past 20 years, largely due to two developments: a severe drawdown in commercial real estate property values in the early and mid-1990s, and distress in the commercial and residential real estate sectors in 2008-2010. These experiences changed the general perception of real estate from a low risk, buy & hold, and inflation sensitive asset class, often viewed as a fixed income alternative, to a risky investment requiring greater management expertise, similar to private equity.

Those pension plans that have remained committed to private real estate experienced returns between public stocks and bonds, as reported in Exhibit 11. Yet there is a considerable range in reported 10 year real estate returns for state pensions, with eight state pensions reporting returns below the 5.1% median return for fixed income. The median real estate return for the 32 reporting state funds was 6.6%, which fell just below the 6.8% state pension median return for the 10 year time period.

The NCREIF Property Index is the most common performance benchmark for private real estate, comprised of over 7,000 institutional commercial properties representing over $300 billion in assets. The Index returned 8.2% over the 10 year period, outperforming the 6.6% median state pension real estate return. It is worth noting that the NCREIF Property Index does not incorporate management fees, which explains some, but hardly the entire 1.6% deficit.

Exhibit 13 shows state pensions that reported the best 10 year annualized real estate returns. Each have significant real estate allocations and reported returns near or above the NCREIF Property Index, reflecting strong strategy execution.

Exhibit 13: Top Performing Real Estate Allocations for 10 Years ended June 30, 2015

	10 Year Return
Ohio STRS	10.9%
Hawaii ERS	9.9%
NY State Teachers RS (NY	9.0%
Washington State Inv Boarc	8.8%
Mass PRIT/PRIM	8.6%
Maryland State RPS	8.5%
Wisconsin RS (SWIB) Core	8.2%
Florida Retirement System I	8.1%
New Mexico ERB	7.7%
Kansas PERS	7.6%

Private Equity

Public pension systems have a long history of investing in private equity, dating back to the early 1980s. Investors view private equity as a substitute for public equity, with the promise of higher return from superior GP skill in financing and direct operating management of companies. In exchange for GP alpha, investors give up the liquidity of public stocks.

The 32 reporting state pensions reporting private equity returns in our most recent study earned a median annual return equal to 11.9% over the 10 years ended June 30, 2015, well in excess of the 8.1% annual return for publicly traded stocks (Russell 3000 Index). These 10-year returns

are particularly instructive because questions surrounding year-to-year valuations go away for the most part over this extended period. Our past studies have shown that private equity has delivered returns over the last three decades averaging 3% annually in excess of public equity benchmarks.

State pensions have used a variety of benchmarks to evaluate private equity performance. Most use a public stock index as a benchmark, like the S&P 500 or Russell 3000, and add another 3% to 5% on top. The 11.9% median 10 year private equity return was 3.7% above the 8.2% annualized return for the Russell 3000 index over the same period.

Exhibit 14 provides private equity performance for the 10 state pensions reporting the highest 10 year returns for the period ended June 30, 2015.

Exhibit 14: Top Performing Private Equity Allocations for 10 Years ended June 30, 2015

	10 Year Return
Mass PRIT/PRIM	16.9%
Texas TRS	15.4%
Iowa PERS	15.0%
Ohio School Employees	14.5%
NY State Teachers (NYSTRS)	13.2%
Alaska TRS	13.2%
Alaska PERS	13.2%
Kansas PERS	13.0%
Maryland State RPS	12.8%
Wisconsin RS (SWIB)	12.8%

Hedge Funds

Hedge funds gained popularity among state pensions after 2008 in an effort to lower asset risk and still earn equity-like returns. Hedge fund allocations grew from less than 1% of total state pension assets in 2006 to 4% in 2015. But more recently that growth has slowed down. Total hedge fund assets equaled $124 billion for fiscal 2015, up a modest $5 billion over the prior year.

Our 10 year data on state pension hedge fund returns is limited to only five state plans. Based on that limited data, we find that hedge funds produced returns similar to bonds – 4.6% median versus 4.4% for the Barclays Aggregate Bond Index – over the 10 year study period at about the same level of risk. And on a risk-adjusted basis[15], hedge funds performed the same as total state pension assets.

Five year hedge fund return data is available on 19 state pension plans with fiscal years ending in June. The median hedge fund return for those 19 state pensions was 6.6%, exceeding the 3.4% return on the Barclays Aggregate Bond Index and the 4.1% return on the HFRI Fund-of-Funds Index. Though a shorter time period, we would observe that the shift among state pensions to direct investments in hedge funds from the prior reliance on fund-of-funds has improved actual hedge fund performance.

Total Fund

Finally, in Exhibit 14 we report the state pensions with 10 year returns in the top half of those with fiscal year ends at June 20, 2015, and the state pensions whose risk-adjusted returns fall in the top half.

[15] Return divided by risk (standard deviation)

Exhibit 14: Top 50% State Pension Returns for 10 Years ended June 30, 2015

		10 Year Return		10 Year Return/Risk
1	Oklahoma Teachers	8.3%	Delaware	0.68
2	South Dakota	8.1%	Iowa PERS	0.67
3	Delaware	7.9%	New Jersey	0.66
4	Minnesota	7.8%	Georgia ERS	0.66
5	West Virginia	7.8%	Georgia TRS	0.66
6	Missouri Local	7.7%	Tennessee	0.65
7	Washington	7.6%	Nevada	0.64
8	Kansas	7.4%	Oklahoma Teachers	0.63
9	LASERS	7.4%	North Carolina	0.62
10	Louisiana TRS	7.4%	Missouri Local	0.62
11	Ohio STRS	7.3%	Kentucky TRS	0.62
12	Iowa PERS	7.2%	Oklahoma PERS	0.62
13	MPERS	7.2%	Idaho	0.60
14	NYSTRS	7.2%	Minnesota	0.60
15	Arkansas PERS	7.2%	West Virginia	0.60
16	New Jersey	7.1%	Arkansas TRS	0.59
17	CalStrs	7.0%	Hawaii	0.58
18	Idaho	7.0%	New Mexico ERB	0.58
19	Kentucky TRS	7.0%	Connecticut Muni	0.57
20	Mass PRIT/PRIM	7.0%	Kansas	0.57
21	MOSERS	7.0%	MOSERS	0.56
22	Oklahoma PERS	7.0%	Louisiana School	0.56
23	Oregon	7.0%	New Hampshire	0.56
24	Hawaii	6.9%	Washington	0.56
25	Arizona	6.9%	LASERS	0.56
26	Iowa Fire & Police	6.9%	Alaska Perm	0.55
27	Mississippi	6.9%	Wisconsin	0.55
28	Nebraska	6.9%	Florida	0.55
29	Nevada	6.9%	South Dakota	0.55
30	New Hampshire	6.9%	Missouri PSRS	0.54
31	New Mexico ERB	6.9%	Ohio STRS	0.54
32	Wisconsin	6.9%	Oregon	0.54
33	Louisiana School	6.9%	NYSTRS	0.54
34	Florida	6.9%	Kentucky ERS	0.54

Conclusion

States overall have been successful stewards of pension assets over our 10 year study period, achieving returns that captured the opportunities presented by global markets, and then some.

However, we find significant differences among individual state pension 10-year returns, mostly unexplained by simple differences in asset allocation or risk-taking. Some state pensions just appear more effective in implementing asset allocation compared to others.

We recommend that fiduciaries overseeing state pensions continue to allocate resources towards maximizing the return potential from its asset classes, paying particular attention to differences in how state pensions implement within asset classes. Unfortunately, the anonymity underlying universe comparisons has made it challenging for fiduciaries to understand why some plans are more successful than others.

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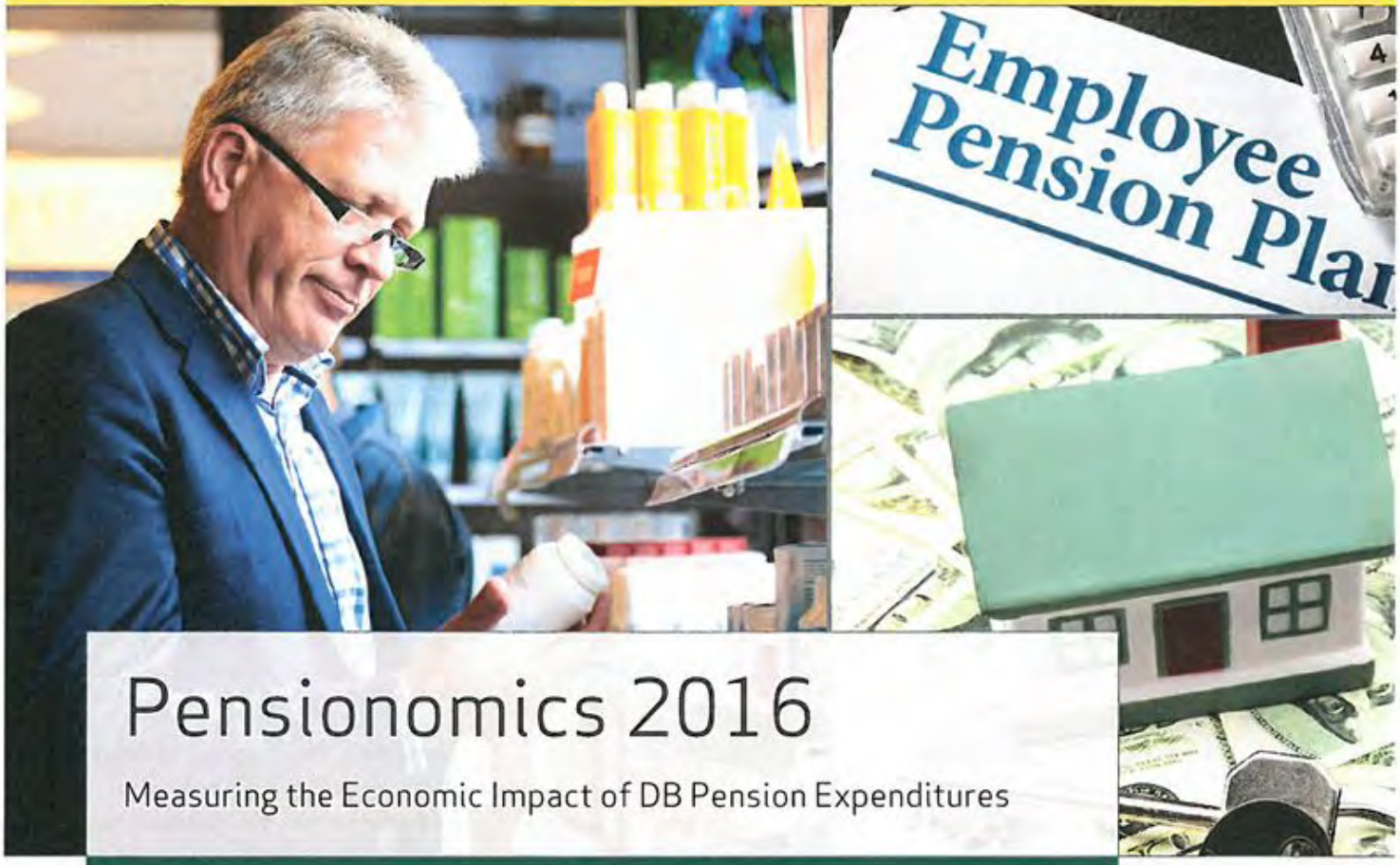

Pensionomics 2016

Measuring the Economic Impact of DB Pension Expenditures

by Jennifer Erin Brown

September 2016

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EXECUTIVE SUMMARY

Defined benefit (DB) pension benefits not only provide a secure source of income for many retired Americans, they also contribute substantially to local, state, and national economies. DB pensions play a vital role in sustaining consumer demand that ultimately supports millions of jobs.

Virtually every state and local economy across the country benefits from the spending of pension checks. For example, when a retired nurse residing in the state of Wisconsin receives a pension benefit payment, s/he spends the pension check on goods and services in the local community. S/he purchases food, clothing, and medicine at local stores, pays housing costs, and may even make larger purchases like a car or laptop computer. These purchases, combined with those of other retirees with pensions, create a steady economic ripple effect. In short, pension spending supports the economy and jobs where retirees reside and spend their benefits. Pension expenditures may be especially vital to small or rural communities, where other steady sources of income may not be readily found if the local economy lacks diversity.

Given that not having enough money for retirement has consistently topped the list of American's money worries, according to the Gallup financial worry metric,[1] reliable pension income can be especially important in providing retirees with peace of mind. In addition, steady income from DB pension plans plays a key role in stabilizing local economies during economic downturns. Retirees with DB pensions know they will receive a monthly check despite economic conditions. In contrast, other retirees may be reluctant to spend out of their 401(k)-type accounts if their savings are negatively impacted by market downturns.[2] To the extent that DB pensions provide retirees with steady income available for spending regardless of fluctuations in the stock market, DB pensions may play a stabilizing role in the economy, similar to Social Security.[3]

This study analyzes data on DB pension plans in both the public and private sectors to assess the overall national economic impact of benefits paid by these plans to retirees. For state and local government pension plans, we also analyze these impacts at the state level for each of the 50 states and the District of Columbia. Because of methodological refinements explained in the Technical Appendix, the state level results are not directly comparable to those in previous versions of this study.

The economic gains attributed to DB pension expenditures are considerable. This study finds that, in 2014:

Nearly $519.7 billion in pension benefits were paid to 24.3 million retired Americans, including:

- $253 billion paid to some 9.6 million retired employees of state and local governments and their beneficiaries (typically surviving spouses);
- $78.8 billion paid to some 2.6 million federal government retirees and beneficiaries; and
- $187.9 billion paid to some 12.1 million private sector retirees and beneficiaries.

Expenditures made out of those payments collectively supported:

- 7.1 million American jobs that paid $354.8 billion in labor income;
- $1.2 trillion in total economic output nationwide;
- $627.4 billion in value added (GDP); and
- $189.7 billion in federal, state, and local tax revenue.

DB pension expenditures have large multiplier effects:

- Each dollar paid out in pension benefits supported $2.21 in total economic output nationally.
- Each taxpayer dollar contributed to state and local pensions supported $9.19 in total output nationally. This represents the financial value of robust long-term investment returns and the shared funding responsibility by employers and employees.

The industries that saw the largest employment impacts were the food services, real estate, health care, and retail trade sectors.

INTRODUCTION: MEASURING THE ECONOMIC IMPACT OF DB PENSIONS

Virtually every state and local economy across the country benefits from the spending of defined benefit (DB) pension payments. For example, when a retired nurse residing in the state of Wisconsin receives a pension benefit payment, s/he spends the pension check on goods and services in the local community. S/he purchases food, clothing, and medicine at local stores, and may even make larger purchases like a car or laptop computer. These purchases, combined with those of other retirees with pensions, create an economic ripple effect. In short, pension spending supports the economy and supports jobs where retirees reside and spend their benefits. Pension expenditures may be especially vital to small or rural communities, where other steady sources of income may not be readily found if the local economy lacks diversity.

Additionally, reliable pension income can be especially important not only providing retirees with peace of mind, but in stabilizing local economies during economic downturns. Retirees with DB pensions know they are receiving a steady check despite economic conditions. In contrast, other retirees may be reluctant to may be reluctant to spend out of their 401(k)-type accounts if their savings are negatively impacted by market downturns. To the extent that DB pensions provide retirees with steady income available for spending regardless of fluctuations in the stock market, DB pensions may play a stabilizing role in the economy, similar to Social Security.[4]

The purpose of this study is to quantify the economic impact of DB pension payments in the U.S. and in each of the 50 states and the District of Columbia (hereafter referred to as "states"). Using the IMPLAN model, we estimate the employment, output, value added, and tax impacts of pension benefit expenditures at the national and state levels.

The remainder of this introduction provides a brief background on DB pensions and an overview of the methodology. Section I outlines the major types of economic impacts measured in this study. Section II presents national level findings. Section III outlines the state-level impact analysis, and Section IV presents the state-level findings.

Background: DB Pensions in the United States

Defined benefit pension plans have existed in the United States since the 19th century. In the private sector, the first DB pension plan was introduced in 1875 by the American Express Company.[5] Over time, many private sector employers saw the

Table 1.
Public and Private Sector Pension Benefits, 2014

	State and Local	Federal	Private Sector	Total*
Beneficiaries	9.6 million	2.6 million	12.1 million	**24.3 million**
Average Benefit	$26,455	$30,302	$15,520	**$21,413****
Total Benefits	$253 billion	$78.8 billion	$187.9 billion	**$519.7 billion**

Note: Author's analysis of the Annual Survey of Public Pensions, Current Population Survey Annual Social and Economic Supplement, and annuity roll data from the U.S. Office of Personnel Management.

*Totals may not add up exactly due to rounding.
** Total average benefit represents a weighted average of public and private sector benefits.

value of offering DB pension coverage to their employees, as these benefits not only were quite valued by workers, but from a human resource management perspective, they also acted as an effective recruitment and retention tool.[6] Although private sector DB plans have experienced a decline in recent decades (due in large part to a difficult regulatory environment),[7] in 2014, 19 percent of full-time private sector employees had access to DB pension coverage.[8]

In the public sector, Congress created the Civil Service Retirement System (CSRS) to provide a pension for civilian federal employees in 1920. In 1986, Congress implemented the new Federal Employee Retirement System (FERS), which includes Social Security, a DB pension, and a 401(k)-type savings plan, called the Thrift Savings Plan.[9] While many major municipalities offered pensions to police and firefighters and 21 states had pensions plans covering teachers by the 1920s,[10] state and local pension systems began to take root on a large scale during the Great Depression. When Social Security was established in 1935, the system left out state and local workers, and many states acted to develop their own retirement systems for their employees. Between 1931 and 1950, nearly half of the large public employee pension plans existing today were established; 45 states had retirement systems in place by 1961.[11]

In 2014, state and local pension plans in the United States collectively held total assets of $3.7 trillion. They served 19.7 million working Americans, including 14.3 million active participants, 5.4 million inactive members, and 9.6 million retirees and other beneficiaries receiving regular benefit payments. Benefit payments in 2014 totaled $253 billion, for an average benefit payment of $2,205 per month, or $26,455 per year.[12]

Federal pension plans currently serve 2.7 million active civilian employees.[13] In 2014, Federal plans paid out some $78.8 billion in pension benefits to 2.6 million retirees and beneficiaries.[14] Private sector pension plans covered 41 million Americans,[15] including 12.1 million retired Americans and other beneficiaries in 2014.[16] With total plan assets of $8.4 trillion in 2014,[17] private DB pensions paid out some $187.9 billion in pension benefits to retirees and beneficiaries.[18] The average private sector pension benefit was $1,293 per month, or $15,520 per year.

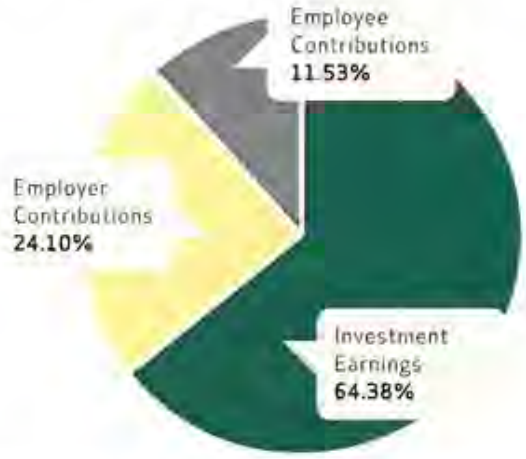
DB plans are pre-funded systems, which means that a retirement fund receives regular contributions for each employee during the course of that person's career. This type of arrangement can be contrasted with "pay-as-you-go" systems like Social Security, whereby contributions of current employees are used to pay benefits for current retirees. Pre-funded retirement systems have the advantage that investment earnings can do much of the work of paying for benefits. In such a system, the contributions made on behalf of current employees are invested, and these investment earnings compound over time. Over a span of decades, accumulation of investment earnings can be substantial, and in many cases pay the majority of the pension benefits.

In state and local government pension plans, typically both the employee and employer make contributions to the pension fund. Pension fund trustees have a fiduciary duty to ensure that the retirement fund is operating in the best interest of workers and retirees, and hire professional managers to oversee fund investments.[19] In this respect, public plans differ from private sector DB plans, which are generally funded solely by employers. In requiring that employees share the cost of their pension, public plans are similar to the approach adopted in 401(k) plans where private sector employees contribute to their accounts.

However, DB pensions are distinguishable from defined contribution (DC) plans, such as 401(k) plans, in that they provide broad-based coverage, secure money for retirement, a lifetime income, and special protections for spouses.[20] Research shows DB plans are more economically efficient than DC plans as pensions can deliver the same level of retirement benefits at nearly half the cost of a DC plan.[21]

State and local pension fund receipts come from three sources: employer contributions, employee contributions, and earnings on investments. **Figure 1** shows that between 1993 and 2014, 24.1 percent of public pension fund receipts came from employer contributions, 11.5 percent from employee contributions, and 64.4 percent from investment earnings. Earnings on investments—rather than employer contributions—have historically made up the bulk of pension fund receipts, even though this time period saw two very large market downturns within a single decade. Because of the continued strong stock market recovery since the 2008 downturn, the share of receipts from investment earnings has increased since our last Pensionomics report, which used data from 2012.[22] Moreover, public pension reform in nearly every state since 2008 has relied heavily on increased employee contributions as a way to reduce taxpayer costs.[23]

Figure 1:
Aggregate State and Local Pension Contributions by Source, 1993-2014



Note: Author's analysis of data from U.S. Census Bureau

Just as contributions from employees and employers have an expanded impact through the compounding of investment earnings over time, a similar dynamic occurs when retirees spend their pension checks. When a retiree receives a pension benefit, s/he spends it on goods and services in the local community. These expenditures have a "ripple effect" in the economy, as one person's expenditures become another person's income.

Measuring the National Economic Impact of DB Pension Plans

This study measures the economic impact of pension benefits paid by public and private pension plans nationally, as well as the economic effects of state and local plans within each state economy. Our analysis rests on the recognition that expenditures have a "multiplier" effect in a regional or national economy. When money is spent at a local business to purchase, say, groceries, that initial purchase generates even more income. First, some of the money spent circulates back to the businesses that manufactured, transported, and otherwise contributed to the production of those goods. Second, the proprietors of these businesses and their employees will spend more money at other businesses, spurring another round of income generation. Thus, with each new round of spending, additional revenue is generated, sustaining jobs, incomes, total output, and tax revenue to the local community. An example of a retiree and the impact of their spending on local businesses is illustrated in this report.

In addition, local economies benefit not only from pension spending by residents, but from pension checks spent in other localities. That is, the economic benefits generated by pension spending in one region "leak" to and are captured by other regions.

Our analysis is focused on the expenditure effects of pension benefits, measuring the economic impacts that result when expenditures made by retirees ripple throughout the economy. Because pension benefits are permanent sources of income—in that they cannot be outlived—we would expect the economic impacts to be larger than those of temporary income increases.[24] For this reason, we would expect the economic impacts of pension benefit expenditures to be larger than those out of, for example, unemployment insurance benefit payments. It should also be noted that this study measures the gross economic impacts of pension benefit expenditures, rather than the net economic impacts. For a detailed explanation, see the Technical Appendix.

Because taxpayers and elected officials have an interest in gauging the ultimate economic impact of each tax dollar "invested" in a state or local pension plan, we calculate a proxy measurement of the total economic impact attributable to each dollar in employer pension contributions made by the taxpayer, called the "taxpayer investment factor." Details follow.

Data and Methodology

The data used for our analysis comes primarily from two sources: the U.S. Census and IMPLAN. We used data for 2014, as it was the most recently available at the time of our analysis.

Data on state and local pension plans comes from the Census Bureau's Annual Survey of Public Pensions, which is a representative sample of state and local DB pension plans in the United States.[25] This survey provides data on revenues, expenditures, financial assets, and membership for state and local pension plans on a national basis and in each of the states. Federal pension data comes data published by the U.S. Office

Illustrating Direct, Indirect, and Induced Impacts

A Retiree's Spending on Housing and Other Daily Needs

Linda is a 62-year old single African American woman living in southern California. She recently retired after working for 30 years. Linda worked in the private sector for a technology company for about five years, then spent the bulk of her legal career working in the public sector.

During her career, she regularly contributed to her retirement plans. Linda now receives defined benefit (DB) pension income of about $3,300 each month from both her private and public sector jobs. In addition, Linda receives retirement income from Social Security, and she also put away additional savings in her defined contribution (DC) retirement account.

Older Californians face some of the highest housing costs in the nation. In fact, the housing costs for four out of 10 Californians exceeds more than 30 percent of their income. It is not surprising that Linda must dedicate a large portion of her pension income toward her housing costs. She spends upwards of $3,000 per month to cover principal and interest on her mortgage, maintenance, property taxes, insurance, and utilities.

"Thanks to my stable pension income, I can afford my home in retirement. And that is no easy feat," Linda says. Income from Social Security income pays for her car, food and healthcare. And if there are any remaining funds, Linda plans to take a vacation or two in retirement.

The money Linda pays in interest, maintenance, insurance and utilities creates a **direct economic impact** on the California economy. An **indirect economic impact** would be created, if she had a contractor mow her lawn and the contractor purchases a new mower or other equipment using some of the money Linda paid his business from her pension income. Additionally, from the pension money that Linda spends on her home, contractors as well as utility and insurance companies purchase supplies and services from other businesses, which generate an economic ripple effect. As these companies hire additional workers as business increases, the spending by these new employees from their paychecks further generates an **induced economic impact**.

"I'm so thankful that I have a reliable pension that I spend on my housing needs each month in retirement," Linda says. "I can be self-sufficient in retirement after a lifetime of work."

The aggregate economic impact of the spending on housing by the 24.3 million retired Americans, who like Linda receive a DB pension, plays an important role in supporting jobs in the real estate sector of the economy. Specifically in 2014, those expenditures supported nearly 383,000 jobs in the real estate industry nationwide.

of Personnel Management.[26] Data on private pension benefits comes from the Census Bureau and Bureau of Labor Statistics' Current Population Survey Annual Social and Economic Supplement (CPS ASEC), which reports sources of household income, including pension and survivor income, by age.[27]

To measure the economic impacts of retiree expenditures made out of benefits paid by DB pension plans, the input-output modeling software, IMPLAN, was used. IMPLAN was first developed in the 1970's as a part of a USDA Forest Service project to analyze the economic effects of local land management projects such as timber, mining, and recreation activities.[28] Since that time, IMPLAN has been used by industry and government analysts throughout the country to assess economic impacts of highly varied local community development projects. These studies include many recent economic impact studies of pension benefit payments from state retirement systems.[29]

Between the time NIRS' original *Pensionomics* study was published in 2009[30] and the release of this report,[31] IMPLAN underwent significant modeling changes. Due to these changes, results of the current study are not directly comparable to those of 2009 study, and the reader should avoid drawing conclusions based on such comparisons. In relation to *Pensionomics* 2014 and *Pensionomics* 2012, the fundamental modeling structure remains the same, and the national results are comparable between this study and the 2014 and 2012 studies. Additionally, the national multipliers have increased since the last study because of fundamental changes in the U.S. economy, and the reported multipliers for many states have increased as well. Detailed information on our data and methodology and further discussion of these differences appear in the Technical Appendix.

I. ECONOMIC IMPACT MEASUREMENTS

In this report, we analyze the economic impact of expenditures made by retirees out of their DB pension payments along four dimensions: employment and labor income, output, value added, and tax revenues. Each of these is described in detail below.

1. Employment and Labor Income Impact: When retirees spend their pension checks, their expenditures help to support jobs—at the local diner, in home repair, in a hospital, or even at a factory somewhere across the country. When a retiree makes a purchase, the money spent translates into business revenues, jobs, and income. Using IMPLAN, we calculated the number of jobs supported by retirees' expenditures. These are broken down among direct, indirect, and induced employment impacts. The direct employment impact occurs when the initial benefit payment is spent by the retiree. The indirect impact occurs as money flows back to businesses that supply goods and services to merchants receiving direct expenditures from retirees. The induced employment impact is attributable to the additional income generated through the purchase of goods and services by workers hired as a result of the direct and indirect impacts. In all cases, the employment impact constitutes an estimate of "annual average jobs" within a single year. We also present estimates of labor income supported by pension expenditures, which is a component of value added, as described below.

2. Output Impact: Total output includes the value of all goods and services produced in the economy. Using IMPLAN, we calculate the value of total output supported by retirees' expenditures of DB pension benefits. As with the employment effects, we present estimates of the impact on total output, broken down by direct, indirect, and induced impacts. The direct impact consists of the initial round of spending. Indirect impacts consist of the rounds of spending by the local merchants. Induced impacts are the additional outputs created when workers, whose jobs are supported by the direct and indirect spending rounds, spend their paychecks in the local economy.

We also calculate a pension expenditure multiplier and taxpayer investment factor. The pension expenditure multiplier tells us the total economic impact attributable to each dollar in pension benefits paid to a retiree. (For example, a multiplier of 2.21 means that every $1 paid to retirees in a local economy supports $2.21 of total output in that region.) We calculate the pension expenditure multiplier by dividing the total output (consisting of the direct, indirect, and induced impacts taken together) by the value of the "initial event" in the economy (in this case, the gross pension benefit). Expenditure multipliers usually lie between 1.0 and 3.0.

3. Value Added Impact: Value added is a net estimate of the creation of "new value" in the economy. Commonly referred to as Gross Domestic Product (GDP), it includes the value of employee compensation, profits, rents, and other aspects of production, but excludes the costs of purchased materials and services. IMPLAN calculates the value added attributable to DB pension benefit expenditures.

4. Tax Impact: Economic activity of all kinds—receiving pension income, earning wages, producing profits, selling goods and services—provides the basis for the tax revenues that are required to fund government services. To calculate the impact that pension payments have on tax revenues, we first calculate the taxes paid by beneficiaries directly on their pension benefits. Then, using IMPLAN, we calculate estimates of taxes attributable to the economic activity that results when retirees spend their after-tax pension checks, and in all subsequent rounds of spending. This includes all corporate, property, and business taxes that are generated through each spending round.

II. RESULTS: NATIONAL ECONOMIC IMPACT OF DB PENSION PLANS

Our analysis indicates that DB pension benefits not only provide a secure source of income for many retired Americans, they also contribute substantially to the national economy. DB pensions play a vital role in sustaining consumer demand that, in turn, ultimately supports millions of jobs, and hundreds of billions of dollars in income, output, value added, and tax revenues.

Employment and Income

Our analysis shows that the $519.7 billion in gross public and private pension benefits paid out in 2014 supported 7.1 million American jobs, as shown in **Table 2**. Of these jobs, 3.4 million were supported by state and local pension benefit expenditures, 1.1 million by federal pension expenditures, and an additional 2.6 million by private pension expenditures. All told, 3.2 million jobs were attributable to direct impacts (direct spending by retirees), 1.7 million to indirect impacts (spending by merchants on businesses further up the supply chain), and 2.2 million through induced impacts (additional jobs supported when employees whose jobs are tied to direct and indirect spending rounds spend their paychecks). These jobs collectively paid out an estimated $354.8 billion in labor income, as shown in **Table 3**.

To put these employment impacts in perspective, the 7.1 million jobs supported by pensioners' expenditures exceed the number of jobs in the entire private construction industry—6.1 million jobs in 2014.[32]

In addition, in 2014 the national unemployment rate was 6.2 percent. The entire civilian labor force in the country consisted of 146.3 million potential workers, of whom 9.6 million were unemployed.[33] In light of these numbers, the fact that DB pension expenditures supported 7.1 million jobs is significant, as it represents a full 4.9 percentage points in the national labor force.

Total Output

Our model further finds that the $519.7 billion in public and private pension benefit payments in 2014 supported $1.2 trillion dollars in overall economic output in the national economy. This consisted of $467.7 billion in direct impacts, $326.4 billion in indirect impacts, and $357.1 billion in induced impacts. In terms of benefit source, $559.7 billion in economic activity stemmed from state and local pension benefit expenditures, $174.4 billion from federal pension

Table 2. **DB Pensions Support 7.05 Million American Jobs**

	State and Local Pensions (# Jobs)	Federal Pensions (# Jobs)	Private Pensions (# Jobs)	Total Jobs Supported* (# Jobs)
Direct Impact	1,542,955	480,759	1,146,000	3,169,714
Indirect Impact	811,804	252,945	602,952	1,667,700
Induced Impact	1,077,568	335,753	800,343	2,213,664
Total Employment Impact	**3,432,326**	**1,069,457**	**2,549,295**	**7,051,078**

*Totals may not add up exactly due to rounding.

expenditures, and $417.1 billion from private pension benefit expenditures. See **Table 4**.

This $1.2 trillion dollars in overall economic output is roughly equivalent to the total output contributed by the entire construction industry, which generated $1.2 trillion in total output in the national economy in 2014.[34]

Value Added (GDP)

Retirees' expenditures of DB pension benefit payments supported $627.4 billion in value added to the national economy in 2014, including $305.4 billion supported by state and local pension benefits, $95.2 billion by Federal pension benefits, and an additional $226.8 supported by private pension benefit expenditures. See **Table 5**.

This $627.4 billion in value added is roughly the same amount as was contributed by the entire construction industry, which generated $664 billion in value added in 2014.[35]

Tax Revenue

Our analysis finds that an estimated $189.7 billion in total tax revenue was attributable to public and private pension benefits in 2014, including $110.4 billion in federal tax revenue and $79.3 billion in state and local tax revenue. (See **Tables 6 and 7**.)

Tax revenue comes from two major sources: taxes paid by beneficiaries directly on their pension benefits and taxes resulting from expenditures made in the local economy (for example, sales taxes resulting from a retail purchase). Of the total tax revenue supported, $42.9 billion came from income taxes paid by beneficiaries on their benefits and $146.8 billion from taxes resulting from the spending of net pension benefits.

To put these numbers in perspective, the total federal tax revenue attributable to public pension benefit payments is more than the $90.6 billion the federal government spent on all elementary, secondary, and vocational education, higher education, education related research, and training and employment services, combined, in 2014.[36] The total state and local tax revenue supported is roughly $11 billion more than state and local governments collectively spent on hospitals.

Economic Impacts by Industry

Table 8 breaks down the economic effects of public and private pension expenditures by the top ten industry sectors affected. Nationally, the largest employment impacts were seen in the real estate, hospitals, food service and wholesale trade sectors. In 2014, pension expenditures supported over 566,000 total jobs in the food services industry, 382,812 jobs in the real estate industry, 330,057 jobs at hospitals, and over 210,600 jobs in the wholesale trade industry.

Table 3. **DB Pensions Support $354.8 Billion in Labor Income**

	State and Local Pensions	Federal Pensions	Private Pensions	Total Labor Income Supported*
Direct Impact	$70.5 billion	$22.0 billion	$52.4 billion	$144.9 billion
Indirect Impact	$48.5 billion	$15.1 billion	$36 billion	$99.7 billion
Induced Impact	$53.7 billion	$16.7 billion	$39.9 billion	$110.2 billion
Total Labor Income Impact*	**$172.7 billion**	**$53.8 billion**	**$128.3 billion**	**$354.8 billion**

*Totals may not add up exactly due to rounding.

Table 4. **DB Pensions Support $1.151 Trillion in Total Economic Activity**

	State and Local Pensions	Federal Pensions	Private Pensions	Total Output Supported*
Direct Impact	$227.4 billion	$70.8 billion	$169.5 billion	$467.7 billion
Indirect Impact	$159.4 billion	$49.7 billion	$117.3 billion	$326.4 billion
Induced Impact	$172.9 billion	$53.9 billion	$130.3 billion	$357.1 billion
Total Output Impact	**$559.7 billion**	**$174.4 billion**	**$417.1 billion**	**$1.2 trillion**

*Totals may not add up exactly due to rounding.

Table 5. **DB Pensions Support $627.4 Billion in Value Added (GDP)**

	State and Local Pensions	Federal Pensions	Private Pensions	Value Added Supported*
Direct Impact	$128.5 billion	$40 billion	$95.5 billion	$264 billion
Indirect Impact	$82.7 billion	$25.8 billion	$61.4 billion	$169.8 billion
Induced Impact	$94.2 billion	$29.4 billion	$70 billion	$193.6 billion
Total Value Added Impact*	**$305.4 billion**	**$95.2 billion**	**$226.8 billion**	**$627.4 billion**

*Totals may not add up exactly due to rounding.

Table 6. **DB Pensions Support $110.4 Billion in Federal Tax Revenue**

	State and Local Pensions	Federal Pensions	Private Pensions	Federal Tax Revenue*
Taxes Paid by Beneficiaries on Benefits	$10.6 billion	$3.3 billion	$7.9 billion	$21.8 billion
Tax Revenue Resulting from Retiree Expenditures	$43.1 billion	$13.4 billion	$32 billion	$88.6 billion
Total Federal Tax Revenue Impact*	**$53.7 billion**	**$16.7 billion**	**$39.9 billion**	**$110.4 billion**

*Totals may not add up exactly due to rounding.

Table 7. **DB Pensions Support $79.3 Billion in State and Local Tax Revenue**

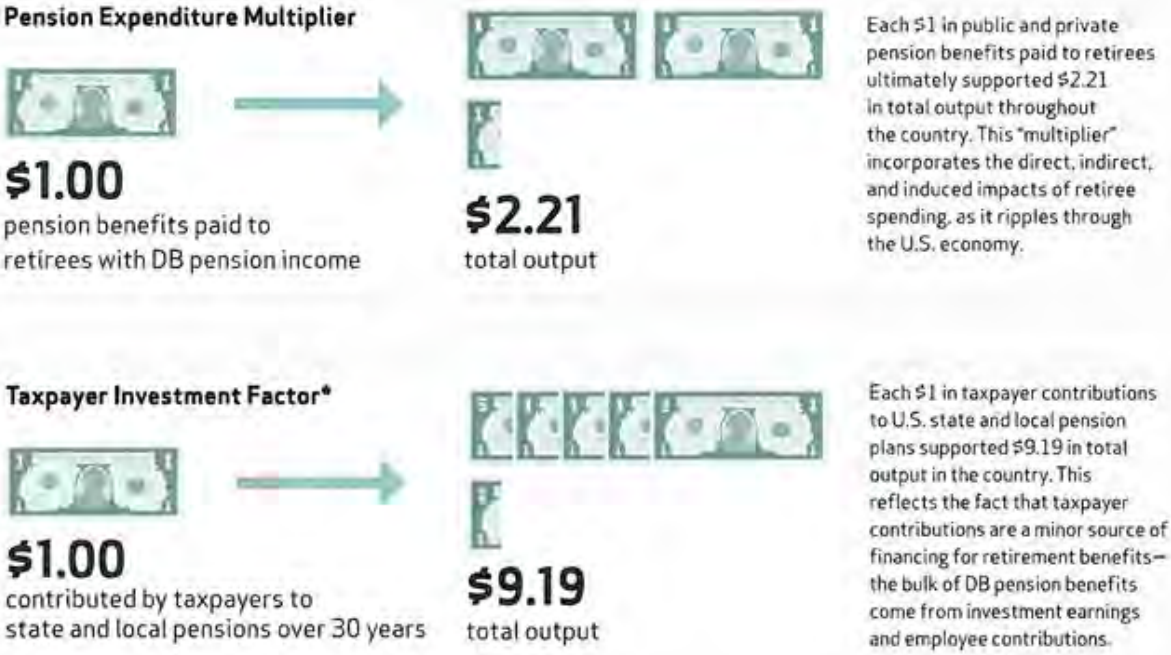
	State and Local Pensions	Federal Pensions	Private Pensions	Total State and Local Tax Revenue*
Taxes Paid by Beneficiaries on Benefits	$10.3 billion	$3.2 billion	$7.7 billion	$21.1 billion
Tax Revenue Resulting from Retiree Expenditures	$28.3 billion	$8.8 billion	$21 billion	$58.2 billion
Total State and Local Tax Revenue Impact*	**$38.6 billion**	**$12 billion**	**$28.7 billion**	**$79.3 billion**

*Totals may not add up exactly due to rounding.

Figure 2: **Economic Multipliers**

The pension expenditure multiplier for 2014 in the U.S. was 2.21, meaning every dollar paid out in DB pension benefits in that year generated $2.21 of total output in the national economy.

Because DB pension plans are prefunded, only a small portion of the total pension payment in any given year is funded through employer or taxpayer dollars, as discussed previously. Therefore, for state and local plans, it may be helpful to calculate the total impact of state and local pension benefit expenditures that is attributable to the "taxpayer investment" in these plans. Because only 24.1 cents of every dollar paid out in pension benefits in 2014 was generated through taxpayer contributions (see **Figure 1**), the taxpayer investment factor is substantially higher than the expenditure multiplier. In 2014, of the $253 billion paid out in state and local pension benefits, only $61 billion was funded by taxpayer dollars. The total economic impact attributable to state and local pension benefits was $560 billion. The taxpayer investment factor, then, was 9.19. That is, every taxpayer dollar contributed to state and local pension plans supported $9.19 in national economic output.



* Caution should be used in interpreting this number. See the Technical Appendix for details.

Table 8. Top Ten Industries by National Employment Impact

	Total Employment Impact (# jobs)				Total Output Impact ($)			
Industry	From State and Local Pensions	From Federal Pensions	From Private Pensions	**Total***	From State and Local Pensions	From Federal Pensions	From Private Pensions	**Total***
Real estate	186,345	58,062	138,404	**382,812**	$36.7 billion	$11.4 billion	$27.2 billion	**$75.3 billion**
Hospitals	160,665	50,061	119,331	**330,057**	$23.9 billion	$7.4 billion	$17.7 billion	**$49.0 billion**
Full-service restaurants	143,863	44,825	106,851	**295,539**	$6.5 billion	$2.0 billion	$4.8 billion	**$13.3 billion**
Limited-service restaurants	131,783	41,061	97,879	**270,724**	$10.5 billion	$3.3 billion	$7.8 billion	**$21.6 billion**
Wholesale trade	102,534	31,948	76,155	**210,638**	$25.0 billion	$7.8 billion	$18.6 billion	**$51.3 billion**
Offices of physicians	93,069	28,999	69,125	**191,193**	$13.2 billion	$4.1 billion	$9.8 billion	**$27.2 billion**
Retail - Food and beverage stores	85,186	26,542	63,270	**174,998**	$5.5 billion	$1.7 billion	$4.0 billion	**$11.2 billion**
Retail - General merchandise stores	82,594	25,735	61,345	**169,674**	$5.5 billion	$1.7 billion	$4.1 billion	**$11.3 billion**
Nursing and community care facilities	79,047	24,630	58,711	**162,388**	$5.6 billion	$1.8 billion	$4.2 billion	**$11.6 billion**
Individual and family services	73,179	22,801	54,353	**150,333**	$2.4 billion	$0.8 billion	$1.8 billion	**$4.9 billion**

*Totals may not add up exactly due to rounding.

III. MEASURING STATE-LEVEL ECONOMIC IMPACTS OF STATE AND LOCAL PENSION BENEFITS

Next, we consider the specific economic impacts of *state and local* pension benefit expenditures within each state, accounting for cross-state economic impacts and migration.

Federal and private pension plans are not included in the analysis because of data limitations.

The economic impacts and multipliers for individual states are collectively smaller than the national impacts and multipliers, because state economies are smaller and less diverse than the national economy as a whole.

The smaller and more homogeneous a local economy is, the smaller the economic multipliers will tend to be for that economy. This is because economic impact analysis, based on local production and purchasing patterns, accounts for economic benefits that leave the state. The economic benefit "lost" to other states or countries is called leakage.

However, because we are interested in assessing the economic impacts of state and local pension benefits nationally, i.e., across all states, we employ an approach that accounts for the fact that one state's "loss" is often another state's "gain." We account for a significant share of the leakage caused by interstate commerce by utilizing a Multi-Regional Input-Output (MRIO) analysis for each of the fifty states and the District of Columbia.

For example, if a consumer in the state of Ohio purchases a new lawnmower, that purchase is broken down into its various components of production: the engineers and designers, the parts manufacturers, and the retail salesperson all receive a portion of the revenue from that sale. Because the lawnmower was purchased within Ohio, the portion of output due the retailer will certainly be added to Ohio's total output. If the lawnmower was designed in Illinois and manufactured in Georgia, however, output from these services would not be included in Ohio's total output, because they were not performed within the state of Ohio, but in those of Illinois and Georgia, respectively.

Because most individual state economies are not as diverse as the U.S. economy as a whole, the state-level multipliers resulting from this analysis—focused on measuring economic benefits at the state rather than national level—will be smaller than the national multipliers. However, whenever all of the services in any single transaction are performed by firms and workers in the U.S., they are accounted for in the national economic impacts.

In addition, we also adjust for net flows of retirees and their pension payments across state borders, drawing on Census data on migration patterns of older households. Retirees who live and therefore spend their income outside of their state of origin contribute to economic activity in their new state of residence.

Thus, each state's total economic impacts consist of net in-state impacts (attributable to pension payment expenditures originating in the state) and net out-of-state impacts (attributable to pension expenditures originating from any of the other states). For more information, see the Technical Appendix.

IV. RESULTS: STATE-LEVEL ECONOMIC IMPACT OF DB PENSION PLANS

While our model does not fully capture all of the state-level economic impact, the results show that every state gained substantial economic benefit from state and local DB pension payments.

Figure 3 and **Tables 9 through 12** provide the key state-level results of the economic impact analysis. Not surprisingly, the state of California—with the largest economy of the 50 states—showed the largest employment, output, and value added impacts: 394,514 jobs, $65.42 billion in output, and $38.1 billion in value added. But even in smaller states, the impacts of state and local pension benefits are substantial.

Figures 4 and 5 present the pension expenditure multipliers and taxpayer investment factors for each state. Pension expenditure multipliers vary somewhat by state, but generally speaking, larger states and those with more diverse economic bases will have larger multipliers than smaller states and those with a more homogeneous economic base. These multipliers account for the impact of pension expenditures originating both from within the state and those pension dollars that originate from another state but are spent within the state in question.

In 2014, the average state-level pension expenditure multiplier was 1.35, meaning that for every dollar paid out in pension benefits received by a state resident, $1.35 in total output was supported within that state.[37] The state with the largest pension expenditure multiplier was Florida, with a total output multiplier of 1.67; again, this is to say that every dollar in pension benefits paid out in Florida supports $1.67 in total economic output in that state.

As is the case at the national level, the taxpayer investment factors for each state are much larger than the pension expenditure multipliers.

Because state and local pension plans are prefunded, only a small portion of the total pension payment in any given year is funded through taxpayer dollars. The total impact of state and local pension benefit expenditures that is attributable to the "taxpayer investment" in these plans is shown in **Figure 6**. In 2014, the average taxpayer investment factor was 5.78, meaning that for every dollar contributed by taxpayers in a single state, $5.78 in total economic output was supported within that state, on average. The state with the largest taxpayer investment factors was South Dakota, at 11.95; again, this is to say that every dollar contributed by taxpayers to these pension plans supported $11.95 in total economic output within that state.

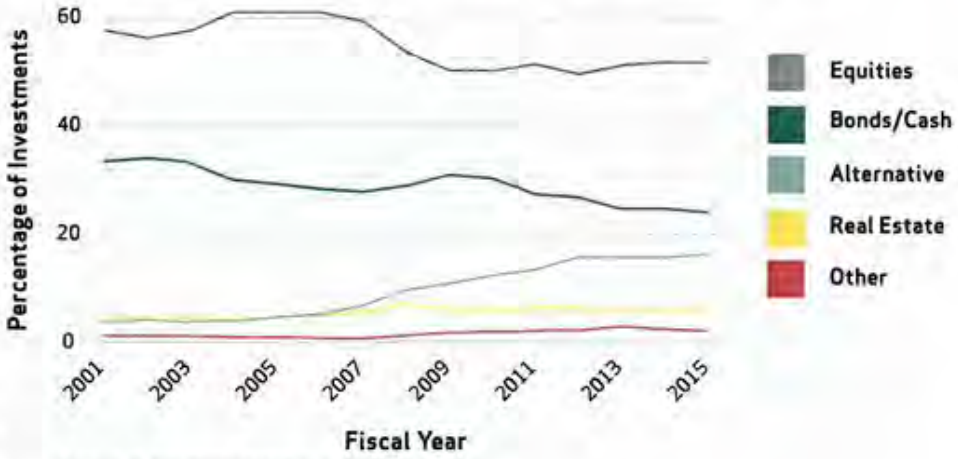
Note that caution should be used in interpreting the taxpayer investment factor for some states. See the Technical Appendix for details.

PUBLIC PENSION'S REAL ESTATE INVESTMENTS ALSO HAVE AN ECONOMIC IMPACT

Public pension funds invest in broadly diversified portfolios that help deliver investment returns over the long term within an appropriate level of risk. Real estate investments represent an asset class that helps pension funds balance investment gains and risks.

Public pension funds have maintained modest allocations to real estate investments for many years. The figure below illustrates the asset allocation of state and local pensions to key assets as a percent of total assets from 2001 to 2015. According to the Public Fund Database, state and local pensions invested $197 billion in real estate related assets, representing nearly six percent of the $3.4 trillion of actuarial assets in 2015.

Asset allocation for State and Local Pensions 2001-2015



Source: Public Plans Database
National data averages are weighted by plan size.

In addition to the jobs in the economy supported by retirees' expenditures, such as Linda's for housing related costs, public pensions also support jobs in the economy through their many investments.

For example, real estate portfolios in public pension funds typically are a mix of investments in commercial, residential and industrial properties across geographic areas. Such investments initially generate construction jobs during a property's building phase. And over the long-term, these properties provide critical infrastructure and space for retail and professional service providers to work, which further provides support for jobs and economic expansion.

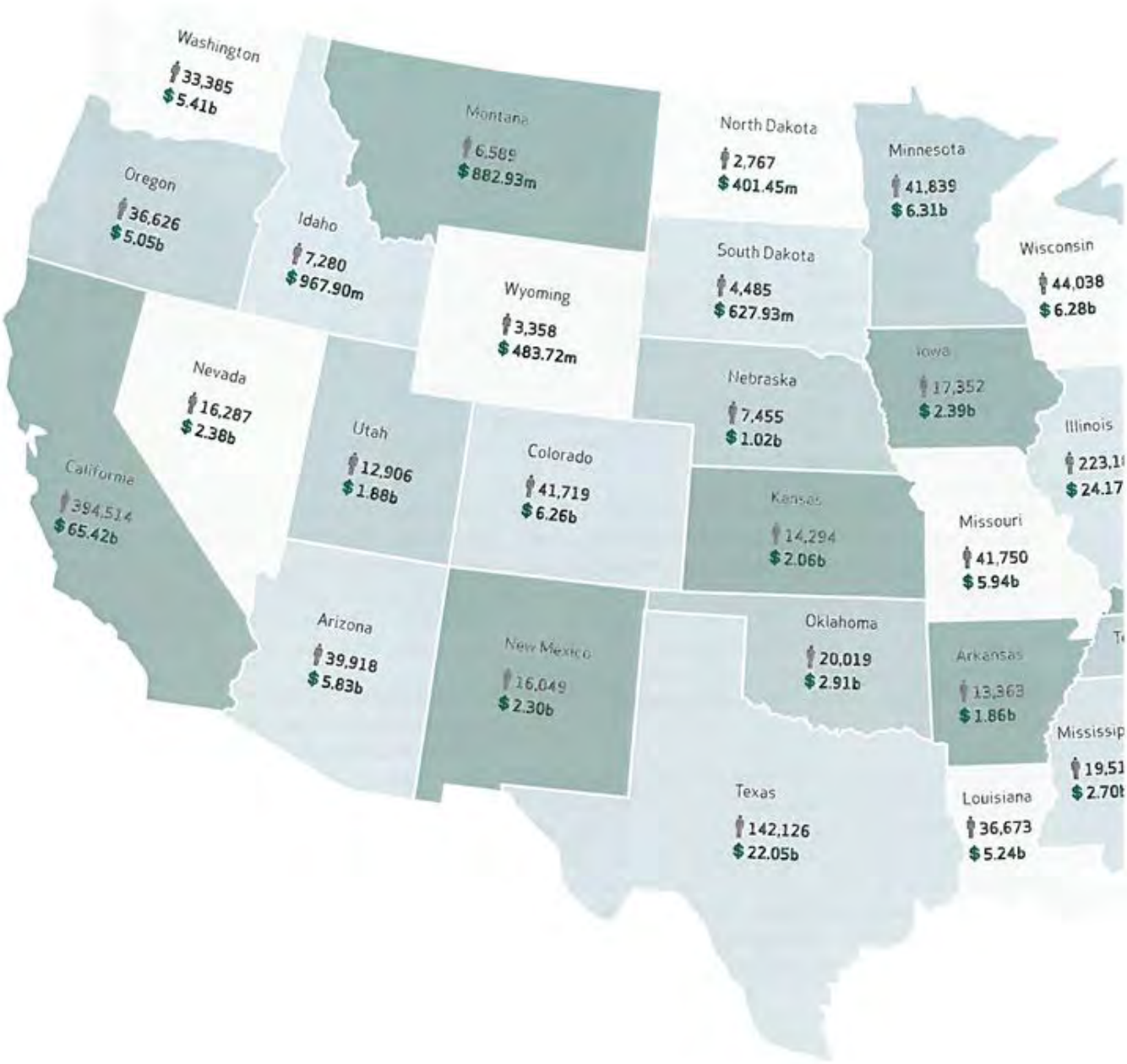
Determining the economic impact of a public pension fund's investments in real estate requires a detailed understanding of each investment. The two largest public pension systems in California asked experts to conducted economic studies of each fund's investments, including the impact of real estate investments in California on jobs in the state.

As of December 31, 2013, the California State Teachers' Retirement System (CalSTRS) had a gross value of $7.5 billion invested in California real estate. Dr. Ashok Bardhan, former senior economist at the University of California, Berkeley, Haas School of Business, calculated that 79,000 jobs in California were supported by CalSTRS' real estate investments.

Looking at the impact of California Public Employees Retirement System's (CalPERS) investments, Pacific Community Ventures calculated that 170,000 jobs in California were supported by CalPERS' real estate investments, totaling $7.2 billion in California as of June 30, 2015.

Sources: "Public Plans Database." Boston College, Center for Retirement Research, Chestnut Hill, MA. http://crr.bc.edu/data/public-plans-database/. A. Bardhan. 2014. "Impact of CALSTRS' Investments on California's Economy." CalSTRS. Sacramento, CA. http://www.calstrs.com/sites/main/files/file-attachments/impact_of_calstrs_investments_on_californias_economy.pdf. and Pacific Community Ventures, 2015, "CalPERS for California Annual Report 2015," CalPERS, Sacramento, CA. https://www.calpers.ca.gov/docs/forms-publications/calpers-for-ca-2015.pdf.

Figure 3: **Employment and Economic Output Impacts by State**



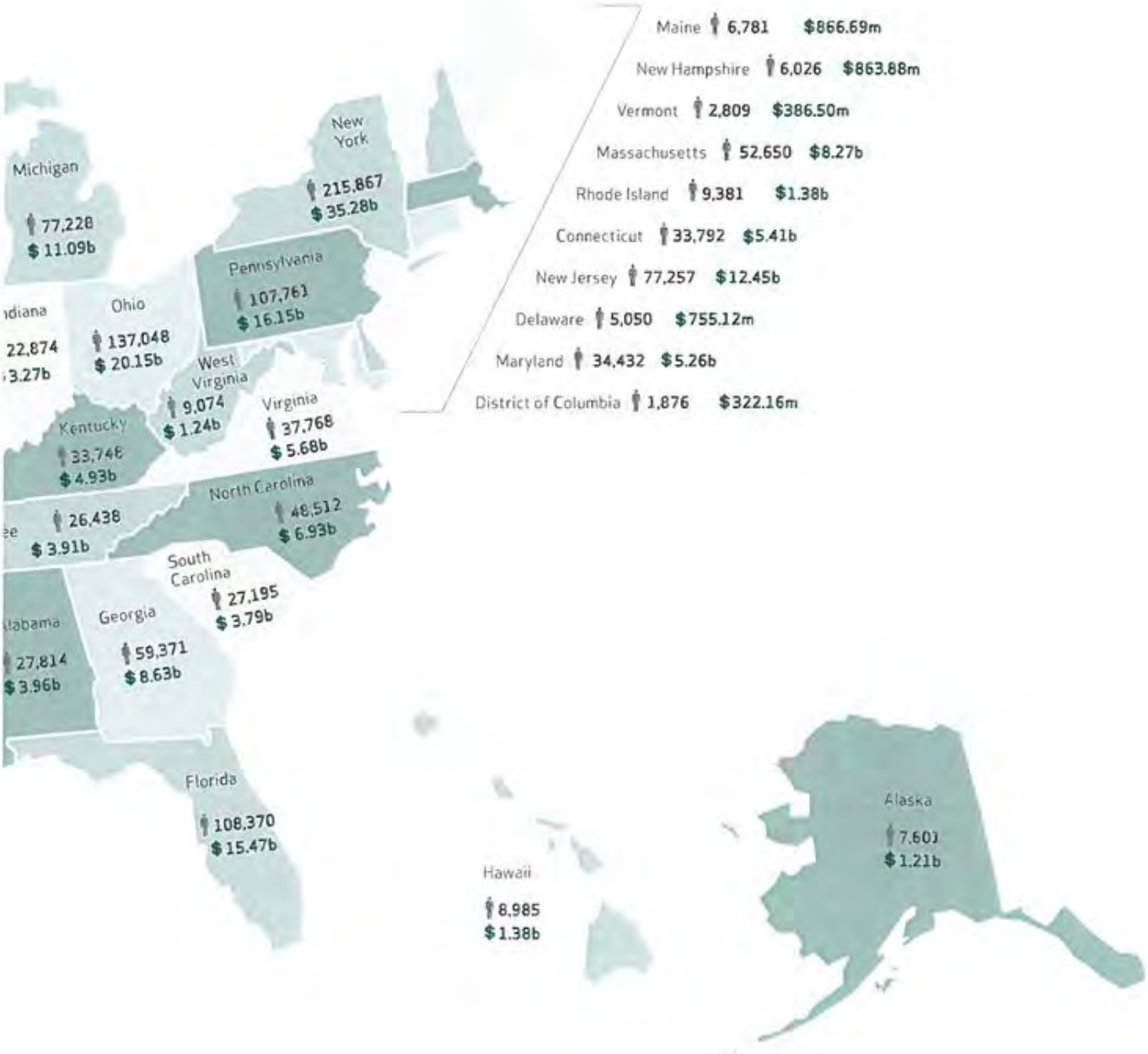

Maine 6,781 $866.69m
New Hampshire 6,026 $863.88m
Vermont 2,809 $386.50m
Massachusetts 52,650 $8.27b
Rhode Island 9,381 $1.38b
Connecticut 33,792 $5.41b
New Jersey 77,257 $12.45b
Delaware 5,050 $755.12m
Maryland 34,432 $5.26b
District of Columbia 1,876 $322.16m
Michigan
77,228
$ 11.09b
New York
215,867
$ 35.28b
Pennsylvania
107,761
$ 16.15b
Ohio
137,048
$ 20.15b
West Virginia
9,074
$ 1.24b
Virginia
37,768
$ 5.68b
Kentucky
33,748
$ 4.93b
North Carolina
48,512
$ 6.93b
South Carolina
27,195
$ 3.79b
Georgia
59,371
$ 8.63b
Florida
108,370
$ 15.47b
Hawaii
8,985
$ 1.38b
Alaska
7,603
$ 1.21b

Table 9. **Employment Impacts by State**

	# Jobs		# Jobs
Alabama	27,814	Montana	6,589
Alaska	7,601	Nebraska	7,455
Arizona	39,918	Nevada	16,287
Arkansas	13,363	New Hampshire	6,026
California	394,514	New Jersey	77,257
Colorado	41,719	New Mexico	16,049
Connecticut	33,792	New York	215,867
Delaware	5,050	North Carolina	48,512
DC	1,876	North Dakota	2,767
Florida	108,370	Ohio	137,048
Georgia	59,371	Oklahoma	20,019
Hawaii	8,985	Oregon	36,626
Idaho	7,280	Pennsylvania	107,761
Illinois	223,182	Rhode Island	9,381
Indiana	22,874	South Carolina	27,195
Iowa	17,352	South Dakota	4,485
Kansas	14,294	Tennessee	26,438
Kentucky	33,748	Texas	142,126
Louisiana	36,673	Utah	12,906
Maine	6,781	Vermont	2,809
Maryland	34,432	Virginia	37,768
Massachusetts	52,650	Washington	33,385
Michigan	77,228	West Virginia	9,074
Minnesota	41,839	Wisconsin	44,038
Mississippi	19,513	Wyoming	3,358
Missouri	41,750		

Table 10. Income and Value Added Impacts by State
(in $millions)

	Income	Value Added
Alabama	$1,206.0	$2,175.0
Alaska	$398.8	$712.6
Arizona	$1,864.7	$3,231.6
Arkansas	$552.4	$1,036.0
California	$21,242.5	$38,092.4
Colorado	$1,969.2	$3,523.1
Connecticut	$1,935.8	$3,347.6
Delaware	$250.0	$454.1
DC	$122.5	$205.7
Florida	$4,781.5	$8,602.1
Georgia	$2,668.4	$4,821.3
Hawaii	$432.7	$788.6
Idaho	$295.4	$516.7
Illinois	$11,674.5	$20,195.3
Indiana	$1,011.7	$1,810.4
Iowa	$743.5	$1,326.9
Kansas	$627.1	$1,123.4
Kentucky	$1,525.4	$2,675.3
Louisiana	$1,637.4	$2,923.9
Maine	$273.7	$495.4
Maryland	$1,730.9	$3,110.5
Massachusetts	$3,065.2	$4,972.8
Michigan	$3,513.9	$6,156.9
Minnesota	$2,060.1	$3,511.4
Mississippi	$796.5	$1,452.8
Missouri	$1,857.1	$3,296.3
Montana	$276.2	$474.1
Nebraska	$318.3	$571.5
Nevada	$742.0	$1,356.0
New Hampshire	$302.9	$508.2
New Jersey	$4,325.9	$7,503.1
New Mexico	$672.9	$1,234.0
New York	$12,525.2	$21,804.7
North Carolina	$2,155.3	$3,886.0
North Dakota	$130.3	$222.7
Ohio	$6,320.5	$11,427.3
Oklahoma	$901.5	$1,572.5
Oregon	$1,642.2	$2,849.7
Pennsylvania	$5,470.0	$9,334.6
Rhode Island	$466.8	$828.0
South Carolina	$1,152.7	$2,082.4
South Dakota	$194.5	$343.0
Tennessee	$1,325.0	$2,209.2
Texas	$6,970.6	$12,302.4
Utah	$545.9	$1,013.2
Vermont	$127.9	$219.7
Virginia	$1,804.2	$3,294.5
Washington	$1,686.0	$3,132.2
West Virginia	$399.9	$701.0
Wisconsin	$1,977.6	$3,539.5
Wyoming	$144.7	$269.5

Figure 4: **Pension Expenditure Multipliers by State**

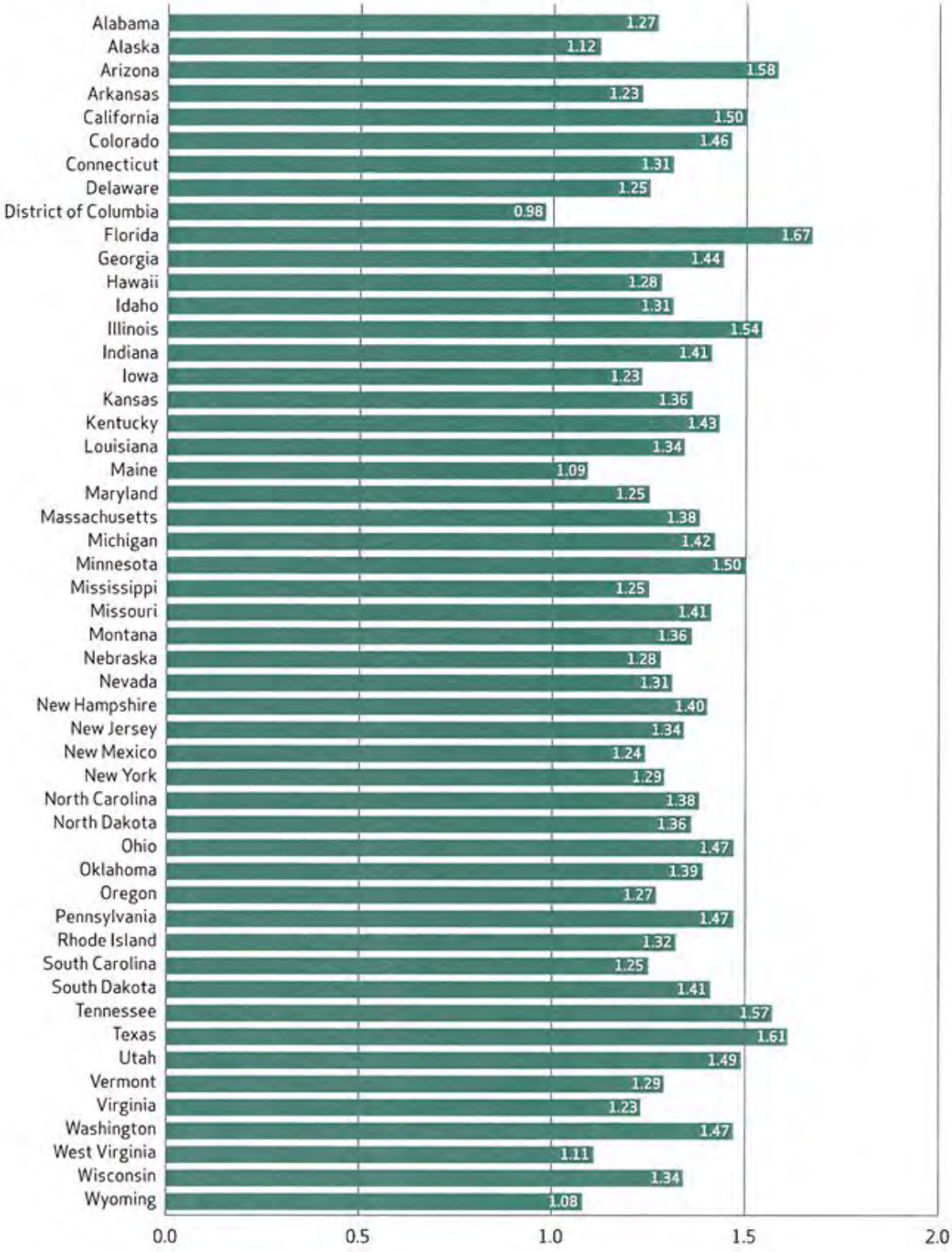


Figure 5: **Taxpayer Investment Factors by State**

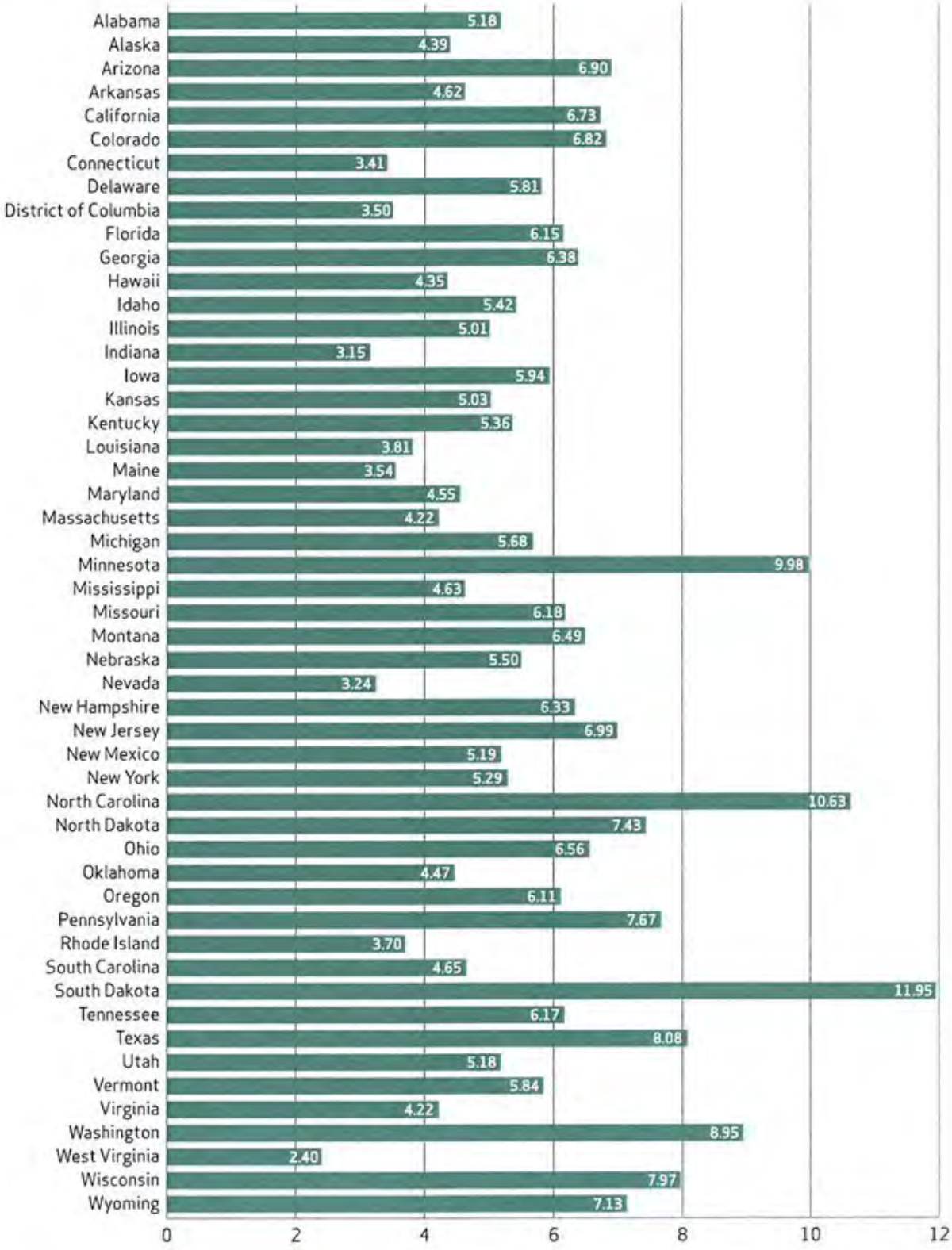


Table 11. Direct, Indirect, and Induced Output Impacts by State

	Output Supported (in $millions)			
	Direct	Indirect	Induced	Total*
Alabama	$1,807.1	$1,267.4	$882.0	**$3,956.6**
Alaska	$602.9	$355.7	$246.1	**$1,204.7**
Arizona	$2,524.1	$1,750.4	$1,541.5	**$5,816.0**
Arkansas	$871.9	$588.5	$394.4	**$1,854.8**
California	$30,588.1	$18,839.9	$15,991.3	**$65,419.3**
Colorado	$2,839.5	$1,900.1	$1,521.5	**$6,261.1**
Connecticut	$2,694.2	$1,444.5	$1,272.9	**$5,411.5**
Delaware	$374.5	$214.5	$166.1	**$755.1**
DC	$191.8	$93.4	$37.0	**$322.2**
Florida	$6,815.1	$4,741.4	$3,914.3	**$15,470.8**
Georgia	$3,868.8	$2,645.3	$2,118.6	**$8,632.6**
Hawaii	$670.3	$403.1	$309.9	**$1,383.2**
Idaho	$428.7	$320.3	$218.9	**$967.9**
Illinois	$11,068.3	$4,979.4	$8,117.3	**$24,165.0**
Indiana	$1,478.1	$1,012.6	$778.6	**$3,269.3**
Iowa	$1,104.0	$759.8	$524.3	**$2,388.2**
Kansas	$938.1	$663.1	$459.3	**$2,060.5**
Kentucky	$2,075.6	$1,655.0	$1,203.2	**$4,933.8**
Louisiana	$2,402.8	$1,642.7	$1,193.8	**$5,239.2**
Maine	$496.3	$185.8	$184.6	**$866.7**
Maryland	$2,555.2	$1,530.5	$1,176.7	**$5,262.4**
Massachusetts	$3,941.7	$2,268.1	$2,062.8	**$8,272.6**
Michigan	$4,942.5	$3,379.1	$2,767.3	**$11,089.0**
Minnesota	$2,756.0	$1,903.4	$1,649.4	**$6,308.8**
Mississippi	$1,226.9	$904.0	$569.7	**$2,700.7**
Missouri	$2,655.5	$1,827.0	$1,455.8	**$5,938.4**

	Output Supported (in $millions)			
	Direct	Indirect	Induced	Total*
Montana	$387.0	$288.9	$207.0	**$882.9**
Nebraska	$476.4	$321.9	$224.6	**$1,022.9**
Nevada	$1,114.9	$734.3	$525.4	**$2,374.6**
New Hampshire	$403.0	$245.8	$215.1	**$863.9**
New Jersey	$6,022.1	$3,454.5	$2,970.3	**$12,446.9**
New Mexico	$1,040.0	$734.0	$491.1	**$2,265.0**
New York	$17,900.2	$9,577.2	$7,801.3	**$35,278.7**
North Carolina	$3,156.1	$2,125.0	$1,649.0	**$6,930.1**
North Dakota	$190.0	$130.0	$81.5	**$401.4**
Ohio	$9,104.2	$5,964.7	$5,078.0	**$20,146.8**
Oklahoma	$1,310.3	$942.3	$660.3	**$2,912.9**
Oregon	$2,304.4	$1,540.9	$1,207.2	**$5,052.4**
Pennsylvania	$7,381.5	$4,644.6	$4,125.6	**$16,151.7**
Rhode Island	$661.9	$384.9	$335.7	**$1,382.6**
South Carolina	$1,724.4	$1,220.1	$846.7	**$3,791.2**
South Dakota	$284.9	$202.6	$140.4	**$627.9**
Tennessee	$1,740.7	$1,150.7	$1,022.4	**$3,913.8**
Texas	$9,963.4	$6,731.7	$5,309.8	**$22,004.9**
Utah	$827.7	$603.0	$440.2	**$1,871.0**
Vermont	$177.7	$117.1	$91.7	**$386.5**
Virginia	$2,729.3	$1,709.3	$1,240.5	**$5,679.1**
Washington	$2,563.6	$1,627.1	$1,224.6	**$5,415.3**
West Virginia	$582.1	$380.3	$273.4	**$1,235.9**
Wisconsin	$2,856.6	$1,909.2	$1,516.5	**$6,282.3**
Wyoming	$237.7	$161.2	$84.8	**$483.7**

*Totals may not add up exactly due to rounding.

Table 12. Tax Impacts by State
(in $millions)

	State/ Local	Federal	Total*
Alabama	$383.4	$319.8	**$703.2**
Alaska	$117.7	$50.7	**$168.4**
Arizona	$574.8	$454.0	**$1,028.8**
Arkansas	$185.6	$195.8	**$381.3**
California	$7,069.2	$6,942.5	**$14,011.7**
Colorado	$651.1	$516.4	**$1,167.5**
Connecticut	$673.9	$603.9	**$1,277.8**
Delaware	$81.4	$69.6	**$150.9**
DC	$37.5	$44.0	**$81.5**
Florida	$1,580.7	$866.0	**$2,446.7**
Georgia	$861.5	$732.9	**$1,594.4**
Hawaii	$150.1	$177.3	**$327.3**
Idaho	$94.4	$110.5	**$204.9**
Illinois	$3,423.4	$2,003.5	**$5,426.9**
Indiana	$319.0	$268.8	**$587.8**
Iowa	$240.2	$237.5	**$477.8**
Kansas	$202.5	$182.9	**$385.3**
Kentucky	$443.2	$308.0	**$751.2**
Louisiana	$509.0	$432.7	**$941.6**
Maine	$108.8	$104.2	**$212.9**
Maryland	$214.5	$274.3	**$488.8**
Massachusetts	$963.9	$748.6	**$1,712.5**
Michigan	$1,126.6	$945.5	**$2,072.1**
Minnesota	$646.0	$714.8	**$1,360.7**
Mississippi	$254.8	$223.7	**$478.5**
Missouri	$582.4	$539.2	**$1,121.6**
Montana	$87.1	$91.2	**$178.4**
Nebraska	$103.6	$114.0	**$217.5**
Nevada	$254.2	$163.7	**$417.9**
New Hampshire	$94.5	$47.8	**$142.3**
New Jersey	$1,476.5	$1,239.2	**$2,715.7**
New Mexico	$218.8	$231.5	**$450.3**
New York	$4,129.9	$4,008.1	**$8,138.1**
North Carolina	$699.4	$659.2	**$1,358.5**
North Dakota	$41.5	$26.2	**$67.7**
Ohio	$1,978.5	$1,619.7	**$3,598.3**
Oklahoma	$280.4	$243.6	**$524.0**
Oregon	$541.3	$596.4	**$1,137.7**
Pennsylvania	$1,698.7	$1,143.3	**$2,842.0**
Rhode Island	$153.1	$138.7	**$291.8**
South Carolina	$383.4	$399.7	**$783.0**
South Dakota	$60.1	$32.2	**$92.3**
Tennessee	$385.0	$223.3	**$608.2**
Texas	$2,244.2	$1,251.4	**$3,495.6**
Utah	$181.0	$183.9	**$364.9**
Vermont	$40.5	$44.6	**$85.1**
Virginia	$626.8	$583.4	**$1,210.2**
Washington	$598.8	$337.3	**$936.1**
West Virginia	$128.9	$149.6	**$278.5**
Wisconsin	$639.5	$686.9	**$1,326.4**
Wyoming	$53.2	$29.1	**$82.3**

*Totals may not add up exactly due to rounding.

CONCLUSION

DB pension plans provide a critical source of reliable income for 24.3 million Americans. These plans are a cost-effective way to provide secure lifetime income for retired Americans and their beneficiaries after a lifetime of work. Moreover, DB pension plans generate economic benefits that reach well beyond those who earned benefits during their working years.

Because pensions supply secure income to retirees, pensions provide local economies with stable sources of revenue. Retirees who spend their paychecks regularly in their local economies—especially during tough economic times—provide vital revenues to local businesses and income to local workers.

These economic gains are considerable. Nationwide, over $1.2 trillion in total economic output resulted from DB pension expenditures in 2014. DB expenditures supported 7.1 million American jobs that paid $354.8 billion in income in that year. Benefits paid by DB pensions supported $189.7 billion in tax revenue at the local, state, and federal levels.

In supplying a stable source of income to retirees, DB pension plans support the national economy, as well as local economies throughout the country, with jobs, incomes, and tax revenue. Pension benefits play an important role in providing a stable, reliable source of income regardless of economic climate—not just for retired Americans, but also for the local economies in which their retirement checks are spent.

TECHNICAL APPENDIX

DB Pension Data

State and local pension benefit payments were taken from the U.S. Census Bureau's Annual Survey of Public Pensions, which reports on state and local government-sponsored pension plans in the United States. The survey provides data on revenues, expenditures, financial assets, and membership in public employee retirement systems.[38] The Census Bureau aggregates plan level data up to the state-level, and these state-level estimates are based on a representative sample of retirement systems throughout the country, weighted for accuracy. We use data for fiscal year 2014 as that was the most recent data available.

Federal pension data used in this study comes from the U.S. Office of Personnel Management.[39] Data on private pension benefits comes from the U.S. Census Bureau and U.S. Bureau of Labor Statistics' Current Population Survey Annual Social and Economic Supplement (CPS ASEC), which reports sources of household income, including pension and survivor income.[40]

Migration

Upon retirement, not all workers continue to reside in their home states. When a pension beneficiary moves out of state, the individual takes the pension payments, spending those pension checks in the new state of residence, rather than in the state where the pension payment originated. Since our state-level analysis information on where pension benefits are spent, we need to account for the movement of retirees from one state to another. To estimate the net effects of retiree movement across state borders, we use data from the 2014 American Community Survey, which tabulates current state of residence and current residence one year before, by age.[41] From this, we are able to calculate the recent net migration patterns of people aged 65 and older. We assume that migration patterns for state and local government retirees mirror those of all other older Americans.

Disposable Income and Taxation

Before calculating the economic impacts of pension benefit expenditures, we account for income taxes that are paid out of pension benefit payments. By doing so, we are able to utilize IMPLAN's institution spending pattern feature, which estimates household spending patterns by income class, and assumes that every dollar entered into the model is spent.

Disposable income is calculated by subtracting income taxes from gross pension payments. To estimate federal income taxes due from state and local pension income, we use data from the Congressional Budget Office on effective federal income tax rates for elderly households in the United States by income quintiles.[42] Effective tax rates are different from marginal tax rates in that effective tax rates account for tax deductions, credits, or other alterations that may change the total amount of the tax that individuals actually pay. This is useful to our purposes, because, since we are using aggregated sample data, we cannot assess actual individuals' federal tax liabilities. The effective tax rate allows us to more accurately estimate the taxes that pension beneficiaries actually pay to the federal government.

Due to lack of current data, we are not able to use effective tax rates for state income taxes on the elderly as were used in *Pensionomics* 2014. Instead, we begin with average marginal tax rates on pension income from the National Bureau of Economic Research, based on their TaxSIM model.[43] We also use information from the National Conference of State Legislatures to account for any public pension exclusions a state may provide.[44] State income tax exclusions are important to consider, because many states offer full or partial income tax exclusions for pension benefits. About half the states either do not subject pension income to income tax, or offer sizeable tax breaks for such income. Because average marginal tax rates are higher than average effective tax rates, for the remaining states with small exclusions or no advantageous tax treatment, our calculations likely overestimate state income tax receipts, at the same time that they underestimate net pension income and resulting economic benefit.

Estimating taxes paid by pensioners requires assuming that beneficiaries are taxed by the state of residence, not the state of the pension's origin. This assumption is consistent with the treatment under federal law that was changed so that after 1995 states' rights to tax retirement income generated from work in the state by individuals who are no longer residents was eliminated for DB and other qualified retirement plans.[45] For example, a retiree moving from New York to Arizona would pay Arizona income taxes on her pension benefit, not New York taxes.

IMPLAN Modeling

This study uses IMPLAN, an input-output modeling software and data package, to estimate the economic impacts of benefits paid by DB pension plans. IMPLAN was first developed in the 1970s as a part of a USDA Forest Service project to analyze the economic effects of local land management projects such as timber, mining, and recreation activities. Since that time, IMPLAN has been used by industry and government analysts throughout the country to assess economic impacts of highly varied local community development projects; these studies include many recent economic impact studies of pension benefit payments. Because of differences in modeling and the data used, the results of our study may not be comparable with these other analyses. Thus, the reader should avoid drawing conclusions based on comparisons between our results and those of other studies.

IMPLAN is an input-output model that uses a matrix to represent the economy of a region in order to estimate the effect of events occurring in a single industry or institution on all other industries, as well as consumers, government, and foreign suppliers to the economy. IMPLAN uses a Social Accounting Matrix (SAM), which captures all the industry and institution transactions in the local area; subsections of a SAM describe various structures and functions of a local economy. The SAM describes a local economy in terms of the flow of dollars from purchasers to producers within a region, while also accounting for non-industrial transactions such as payment of taxes by businesses and households. This offers a better portrayal of the household income effect portion of local economic events than other models.

Between when NIRS' original *Pensionomics* study was published in 2009 and the release of *Pensionomics* 2014, IMPLAN underwent significant modeling changes. Version 2, used in the original study, used an Econometric Regional Purchase Coefficient (RPC) method. The more recent Version 3, utilized in this study and in *Pensionomics* 2014, uses a trade flow model. Due to its internal consistency and by accounting for spatial variables like the proximity and size of alternative markets, the trade flow model is presumed to be superior to econometric methods for estimating regional RPCs.[46] Internet sales, for example, are given a lower impedence in the trade flows model than in the econometric RPC model, especially compared to the other retail sectors, meaning that it is more likely that such e-commerce will be imported. Thus, interstate commerce leakages in the trade flows model are likely to be higher than in the previous version. Due to these changes, results of the current study are not directly comparable to those of the 2009 *Pensionomics* study, and the reader should avoid drawing conclusions based on such comparisons.

National results in this study are generally comparable to the results in the updated edition of *Pensionomics* 2014. However, state-level results are not comparable due to technical refinements in modeling technique, described later in this section.

National and state by state IMPLAN data for 2014 were used, as this corresponded with the Census data on public pension payments, for which 2014 was the most recently available. For this study, each state's aggregated, in-state, disposable pension payments are entered into IMPLAN as direct payments to households. IMPLAN estimates household spending patterns by income class. The household income range used is based on the 2014 median household income among pension-receiving households age 65 and older, taken from the 2014 Current Population Survey ASEC.[47]

Benefits that migrate out of state are assumed to be spent in the receiving state. Therefore, each state's economic impact includes out of state benefit payments in addition to benefits originating from pension systems in the state. Pension benefits, net of migration, are calculated based on the migration assumptions described above. Then estimated income taxes are subtracted to yield net after-tax pension payments. These net payments are then entered into the IMPLAN model for that state.

However, not all the economic benefits stay in the same state in which pension dollars are originally spent. One state's "leakage" is another state's inflow, and since our analysis is concerned with measuring the economic impact of state and local pension benefits, regardless of where they were originally spent, we also need to account for the economic impacts of these benefits across state lines. As IMPLAN Version 3 utilizes a trade flow model to estimate the SAM, we are able to account for the economic effects flowing out of one state and into to another by utilizing a Multi-Regional Input-Output Analysis (MRIO). For example, to determine the economic impacts of $1 million in Alabama's pension payments that may flow to the state of Alaska, we set up an MRIO analysis of Alabama's pension payments between Alabama and Alaska. Thus, we are able to recapture some of any single state's economic leakage due to interstate commerce. Additionally, the resulting economic activity in Alaska may spill over or leak into California, and so on and so forth.

However, the ability to capture leakage in IMPLAN through MRIO has technical limitations because the program cannot run a single model that analyzes the impact of one state on all the other states simultaneously. Rather, the number of states that can be linked for such analysis in any single instance is technically limited by the software and by computing power. This means that the states need to be divided among a number of batches comprising subnational groups, and that the flow of economic impact across this groups is lost. For this study, due to improved computing power, we were able to link several more states together at the same time than was possible for *Pensionomics* 2014. (States were grouped into large economic regions for the purposes of MRIO analysis, but not aggregated, so that results could be identified for each and every state.) This allowed us to capture more of the economic impact.

Gross Economic Impacts

This study measures the gross economic impacts of pension benefit expenditures only, rather than the net economic impacts. Pension payments are a form of deferred compensation, meaning that employees and employers contribute to the pension trust over the course of an employee's career as a portion of the employee's total compensation. Had that employee received that compensation in another form—for example, a slight increase in gross pay each month—s/he would have seen higher disposable income, and presumably would have spent a portion of that income in the local economy at that time. Accurately accounting for the net economic impacts of public pensions would require a dynamic model and data that spans several decades. Because of data limitations, this is not possible.

Although one might be tempted to simply deduct from a single year's gross benefit payments the total employee and employer contributions in that year to capture a net effect, such a measure will not be accurate. First, the contributions for any given year for active employees have no bearing on the benefits paid out in that year to retirees. Due to the nature of prefunded pension systems discussed earlier, older, more mature pension systems could likely be construed as having a larger economic impact than younger, less mature systems, simply because the older system will generally pay out more benefits per current worker. Yet this interpretation would be highly inaccurate, since the whole point of prefunding is that current workers do not pay the benefits of retirees, but pay into the system during the course of their career for their own retirement. Due to these limitations and possible misinterpretations, the analysis we present here assesses gross economic impacts, rather than net impacts.

Tax Revenue

To calculate total tax revenue attributable to state and local pension payments, income taxes paid by beneficiaries on benefit payments are added to taxes paid in all subsequent rounds of spending. For the former, the federal and state taxes are calculated as described above. For the latter, IMPLAN calculates all corporate, personal income, and business taxes that are attributable to each spending round: direct, indirect, and induced expenditures. Total tax revenue is the sum of these two figures, calculated for both in state and out of state benefits.

Multipliers

Multipliers are ratios that relate the overall economic effect to a single unit of any initial event. An output multiplier, for example, displays the total output generated for every dollar that is initially spent in the economy. We calculate a pension expenditure multiplier, which describes the impact on total output for each dollar of pension benefit. For example, a pension expenditure multiplier of 2.2 would mean that for every $1 paid out in a pension benefit, $2.20 of total economic

output is supported. We calculated pension expenditure multipliers at the national level and for each of the states.

Pension expenditure multipliers are calculated by dividing the total output supported by retiree expenditures by total pension payments made in that year. (For the state-level multipliers, this includes pension payments originating within the state as well as outside of the state.)

Readers should note the following caveats when interpreting state-level pension expenditure multiplier results. First, because of the current technical limits of MRIO analysis, the share of leakage captured likely varies somewhat across states. Furthermore, the method we used to calculate the state-level economic multipliers is conservative in two ways. On the one hand, for states that sent out more economic benefit to other states than they received from pension spending in other states, we used the lower in-state economic impact in our calculations. This results in a state-level multiplier that is smaller than the multiplier that results from counting the full impact of that state's pension expenditures on national economy. On the other hand, for states that received more economic benefit from pension spending in other states than they sent out, we excluded the surplus economic benefit from the multiplier calculation. Thus, the state-level multipliers published in this study are generally conservative.

We also calculate "taxpayer investment factors" at the national and state levels. This measurement is designed to capture a sense of "return on investment" for each dollar contributed in taxpayer contributions to state and local plans, following the methodology developed by Fountain and Waste.[48] First, we proxy the proportion of benefits paid out in 2014 that were attributable to taxpayer contributions. We do this by calculating (both nationally and for each state), the proportion of total state and local pension plan revenues that are attributable to taxpayer contributions over the period 1993 through 2014. We then multiply this percentage by the benefits paid by state and local pension plans (again at the national or state level) in 2014. This becomes the denominator for our taxpayer contribution factor. The numerator is the total output supported by retiree expenditures in 2014. Put another way, the taxpayer investment factor is the benefit multiplier divided by the taxpayer contribution percentage.

Caution should be used in interpreting the taxpayer investment factor for some states, due to the way the Census Bureau reports taxpayer and employee contributions. Because the Census Bureau data reflects the taxable status of contributions only, but not the pre-tax salary reduction cost-sharing methods used in some states (Nevada, for example), employee contributions may be reported as taxpayer contributions. This will tend to overstate the proportion of pension benefits that are attributable to taxpayer contributions and understate the taxpayer investment factors we report.

Alternatively, to the extent that any particular pension fund has not received its full Annual Required Contribution between 1993 and 2014, the proportion of pension fund receipts attributable to the employer contribution may be understated. This will tend to understate the proportion of pension benefits attributable to taxpayer contributions and overstate the taxpayer investment factors we report.

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U.S. State Pensions: Weak Market Returns Will Contribute To Rise In Expense

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U.S. State Pensions: Weak Market Returns Will Contribute To Rise In Expense

Waiting For Recovery

After losses in 2008 and 2009, most U.S. state pension plans have not been able to recover to funded levels seen in the early 2000s. Investment returns in 2015 and 2016 are not going to make that path any easier. Most plans report on a June 30 year-end, and while the year ended June 2014 posted strong market returns, short-term stock market volatility at the end of June 2015 -- related to stalled negotiations between Greece and its creditors -- contributed to lower reported pension funded ratios for most plans in 2015, according to a survey by S&P Global Ratings. Then, Brexit in June 2016 created another ill-timed blow to market performance. Although a month-end rally recovered Brexit-related losses, investment returns announced to date by many of the largest state plans still averaged less than 1% for the year ended June 30, 2016, which we expect will depress future reported pension funded ratios.

Given the long-term nature of the obligations and their payout, most state pension funding policies stress a long-term view of funding estimated liabilities and smoothing market performance over several years. As a result, the full impact of market losses will not be reflected immediately in states' required pension contributions but will gradually increase as annual market fluctuations are phased in to avoid year-to-year budget shocks. Nevertheless, a trend of lackluster investment returns, together with forecasts of lower expected market returns over the next 10 years, has brought on renewed calls from some financial economists for lower rate of return and discount rate assumptions. When public pension plans assume a lower rate of return, all else being equal, governments must dedicate a greater proportion of their revenue to pension contributions to meet the higher estimated pension liability. Continued trends of slow revenue growth, growing liabilities, and higher future pension contribution costs could amplify an already constrained budget environment for many states.

Overview

- Weak market returns in 2015 dampened pension funded ratios reflected in new GASB accounting with market valuation of assets.
- A second year of soft market results in 2016 could pressure plans to continue to adopt lower discount rate assumptions, pursue higher yields, or reprise attempts for pension reform.
- How pension plans and state governments manage current assets and future contributions is key to the future health of pension systems and state budgets.

A state's prudent management of its long-term liabilities is important for long-term credit stability. The majority of the largest state plans still assume an annual return between 7.5% and 8%, although there continues to be significant debate in the market about whether the discount rate assumptions used for public pension plans remain too high. In light of lower than expected market returns and expectations for this trend to continue, plan managers have been

under pressure to better align plan assumptions with the market reality of the past couple years by either lowering the actuarial assumed returns assumptions used in their funding policies or pursuing higher yields through riskier investment strategies. We have noticed that more plans are moving to gradually lower assumed rates of return, although many remain within the 7.5% to 8% band. For example, Oregon's Public Employees Retirement system elected to change its assumed rate of return to 7.5% from 7.75% for calendar 2016 which, along with a recent court decision reversing previous pension reform, will impact employer contribution rates in future biennia. Washington will change the assumed rate of return for most of its plans to 7.7% from 7.8% and the Hawaii Employee Retirement System's assumed rate will change to 7.5% from 7.55% beginning in July 2017. New York State has also moved from 7.5% to a 7% return assumption for its 2015 retirement system valuation which will be reflected in future plan comprehensive annual financial reports (CAFRs).

In our view, these decisions represent a difficult tradeoff between reducing the long-term risk associated with uncertain and volatile market returns in exchange for increased budgetary pressure. For example, in August, the Illinois Teachers' Retirement System board voted to lower the assumed annual rate of return further to 7% from 7.5%. We expect that decision to add upwards of $400 million to Illinois' fiscal 2018 budget and increase the state's already sizable $4 billion to $5 billion structural budget gap. We believe that, while complicating budget negotiations even further, this true reckoning of the challenges ahead is positive from a credit standpoint. However, even as some plans bring their return assumption closer to 7%, others suggest these return assumptions might still be too high. A recent publication by Alicia Munnell at the Boston College Center for Retirement Research assumes a 6% expected nominal return in its analysis of government pension liability and contributions (Munnell, Alicia H. and Jean-Pierre Aubrey, "An Overview of the Pension/OPEB Landscape").

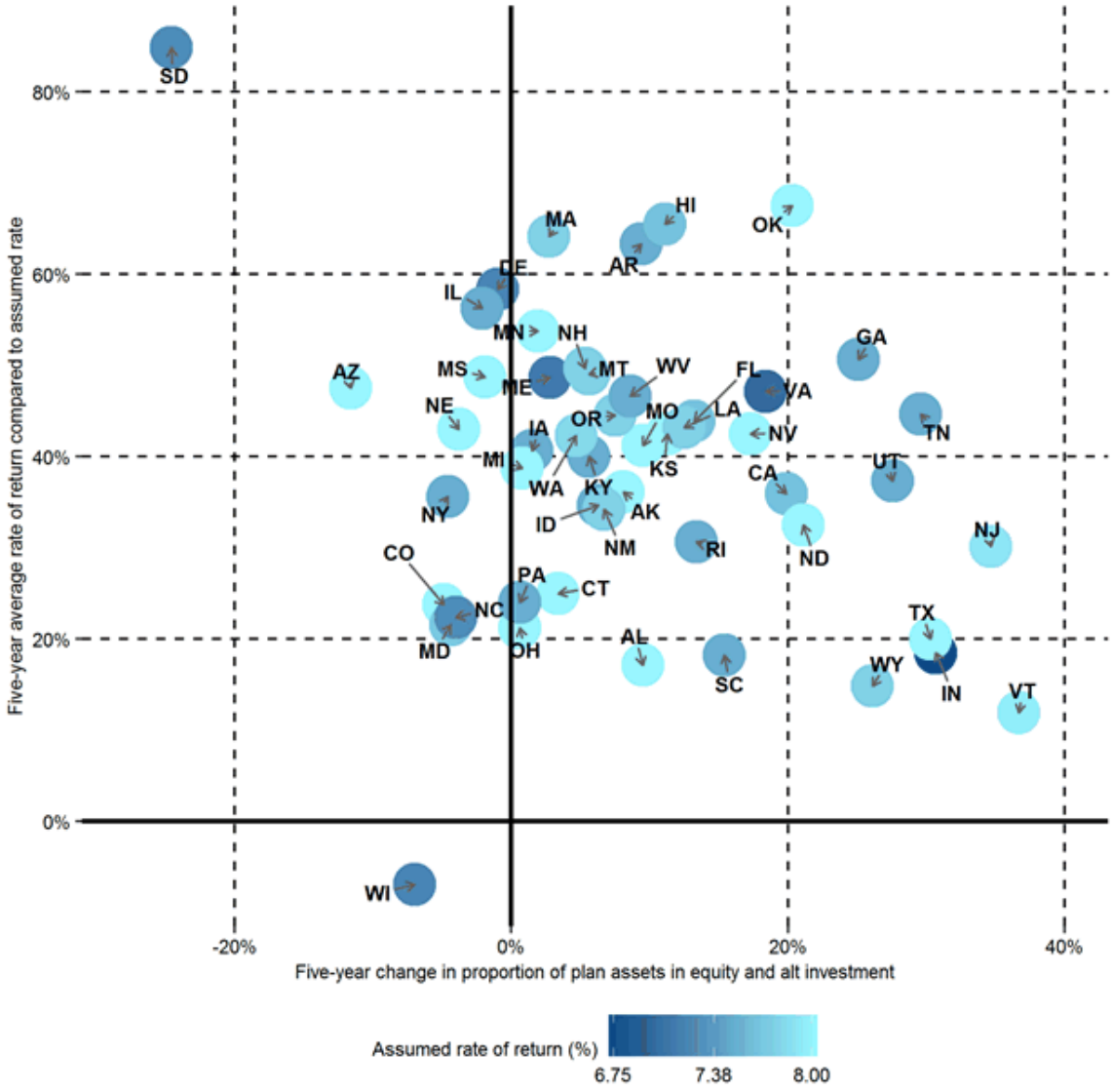
In order to maintain higher assumed return targets, some plans have adopted riskier investment allocations, which poses a different set of challenges. This strategy could be attractive in order to maintain higher assumed rates of return and avoid immediate recognition of higher estimated liabilities and contributions. However, riskier investment strategies expose plans to higher volatility and a series of return shortfalls could compound underfunding with steeper growth in contribution rates over time. Chart 1 shows that actual five-year average returns through 2015 still generally exceed the assumed rates of return for the largest state pension plans, but investment allocations have also grown riskier in the previous five years. Using reported plan investment allocations between 2010 and 2015 found on the Public Plans Data website maintained by the Center for Retirement Research at Boston College or in plan reports, we note the proportion of the portfolio allocation among equity and alternative investments for the states' largest pension plan (measured by share of the state's net pension liability (NPL)) averaged 68% and grew by more than 8% compared to the allocation five years earlier.

Finally, as the challenge of meeting investment returns and contribution hikes intensifies, states might also resume the quest for pension reform to manage rising pension liabilities, despite a road fraught with legal hurdles and setbacks. How states and plans manage these pressures and craft funding policies to meet a realistic estimate of the long-term pension liability is important to future state credit quality.

U.S. State Pensions: Weak Market Returns Will Contribute To Rise In Expense

Chart 1

Plans Increase Riskier Investment Allocation To Meet Return Targets



IN reflects the investment allocation of the consolidated defined benefit assets across INPRS funds. WI reflects the investment allocation for the Wisconsin Retirement Fund reported as of Dec. 31, 2014 compared to Dec. 31, 2009.

Healthy Systems And Budgets

The future long-term health of pension systems and state and local government budgets is influenced by whether:

- Plans are making some annual progress on funding the unfunded liability;
- Funding policies are well-crafted and plan managers proactively target realistic assumptions;
- Governments are committed to adequate annual funding; and
- Governments are successful in pension reform initiatives to control growth in liabilities.

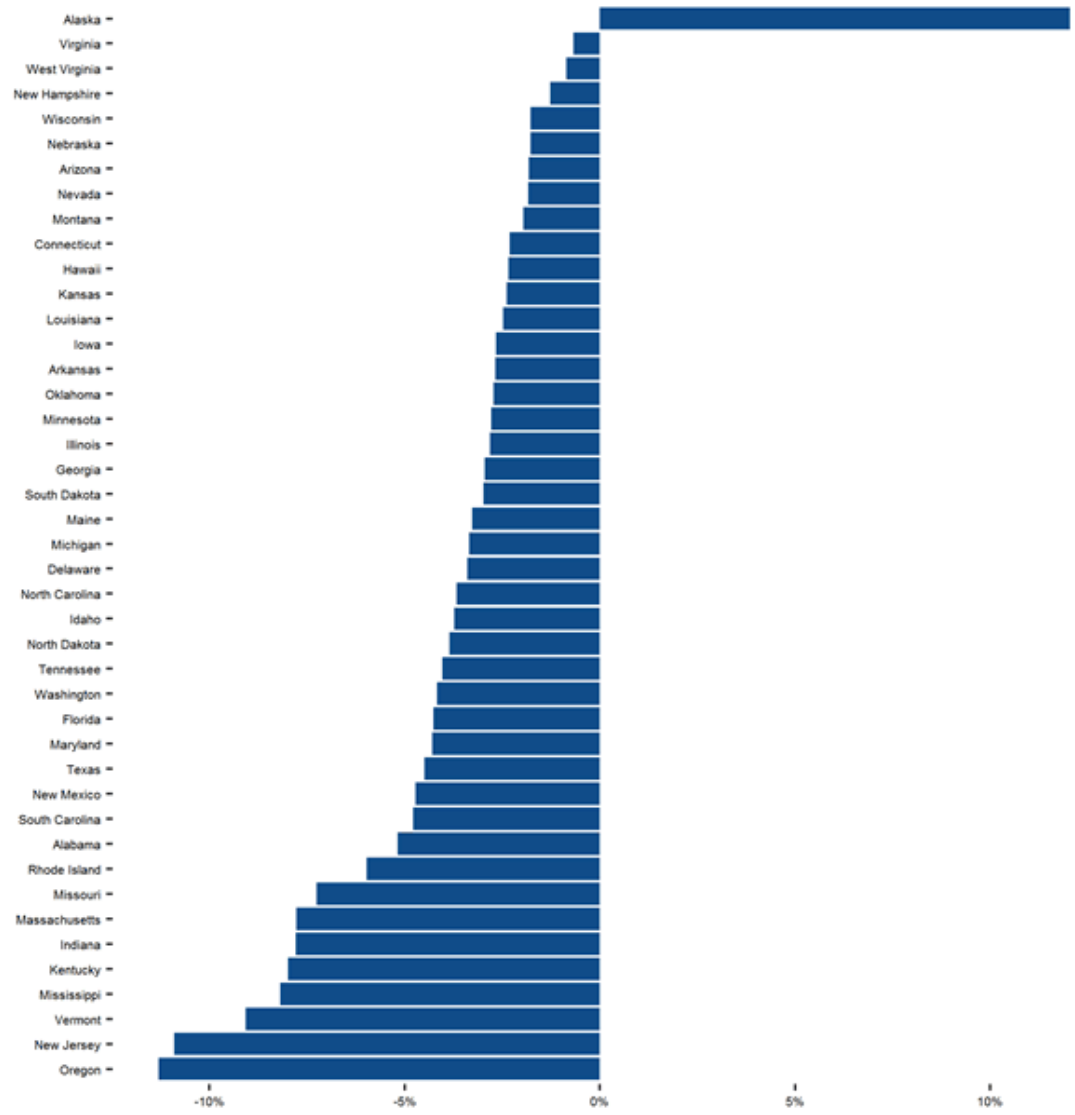
Survey Results

Our 2015 survey results incorporate reported pension liabilities under the Governmental Accounting Standards Board (GASB) statements 67 and 68, which took effect for employers and governmental non-employer contributing entities for fiscal years starting on or after June 15, 2013, and June 15, 2014, respectively. The statements change how pension liabilities are accounted for and reported in state and local governments' financial statements. The new standards also value pension plan assets to market and incorporate this volatility in year-to-year reported pension funded ratios.

Pension funded ratios

Based on plan information reported through the end of fiscal 2015, the median funded ratio across state plans was 74.6%. We have seen two years of pension plan financial statements for most pension plans since the rollout of GASB 67 reporting standards with a majority of plans reporting a decline in funded ratios between fiscal 2014 and fiscal 2015. Chart 2 reflects this general negative trend in funded ratios between fiscal 2014 and fiscal 2015 due to relatively weak market performance and higher reported liabilities. One exception to this trend was a 12% improvement in Alaska's funded ratios after the state made an extraordinary $3 billion contribution from its constitutional budget reserve fund to boost assets in its public employees retirement plan and its teachers plan.

Chart 2
Change In GASB 67 Funded Ratio: Fiscal 2015 vs. Fiscal 2014



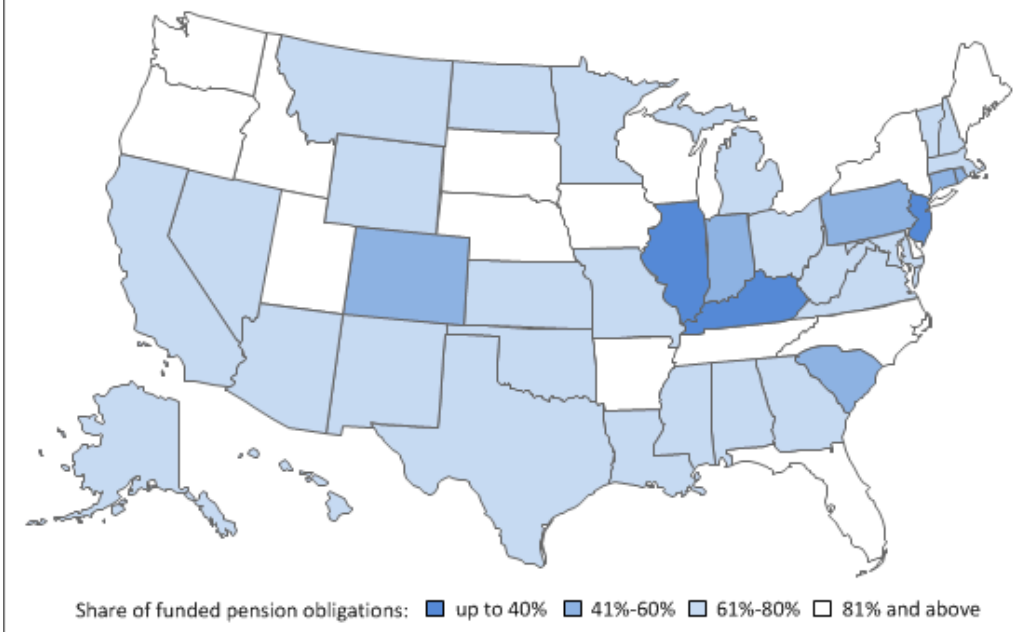
Excludes seven states for which the major GASB 67 plan reports were not available for two years.

South Dakota, Wisconsin and North Carolina continue to lead among the states with the highest funded pension ratio. Compared to our last pension survey (see "U.S. State Pension Roundup: Recent Court Rulings And Reform Slowdowns Make Active Management Essential," published June 18, 2015), Florida and New York rose to the top five, benefiting from the market valuation of assets under the new reporting standards. Although Oregon had previously ranked among the top five states with the highest funded ratios, it fell out of the ranking after the Oregon Supreme Court overturned a significant feature of the state's 2013 pension reform legislation which consequently increased estimated

plan liabilities. In particular, the court ruled that Oregon could not reduce cost-of-living adjustments on benefits Oregon Public Employees Retirement System employees had earned before the enactment of the reform legislation. The higher liability estimates contributed to an 11% decline in Oregon's fiscal 2015 reported funded ratio compared to fiscal 2014. Oregon estimates pension contribution costs will grow by $316 million for the 2017-2019 biennium, or 1.6% of the tentative $20 billion two-year budget because of the higher OPERS liability estimates.

Likewise, Connecticut, Kentucky, and Illinois continue to rank among the states with the worst funded ratios. Compared to last year's report, New Jersey reported a lower pension funded ratio which incorporates higher estimated liabilities under the new reporting standards due to projected future depletion of pension asset and a blended assumed discount rate for most of its state plans.

Chart 3
Pension Funded Ratio



Fiscal 2015 Best-Funded Pension Ratios	
South Dakota	104.1
Wisconsin	102.7
New York State	98.1
North Carolina	94.6
Florida	92.0

Fiscal 2015 Worst-Funded Pension Ratios	
Kentucky	37.4
New Jersey	37.8
Illinois	40.2
Connecticut	49.4
Rhode Island	55.5

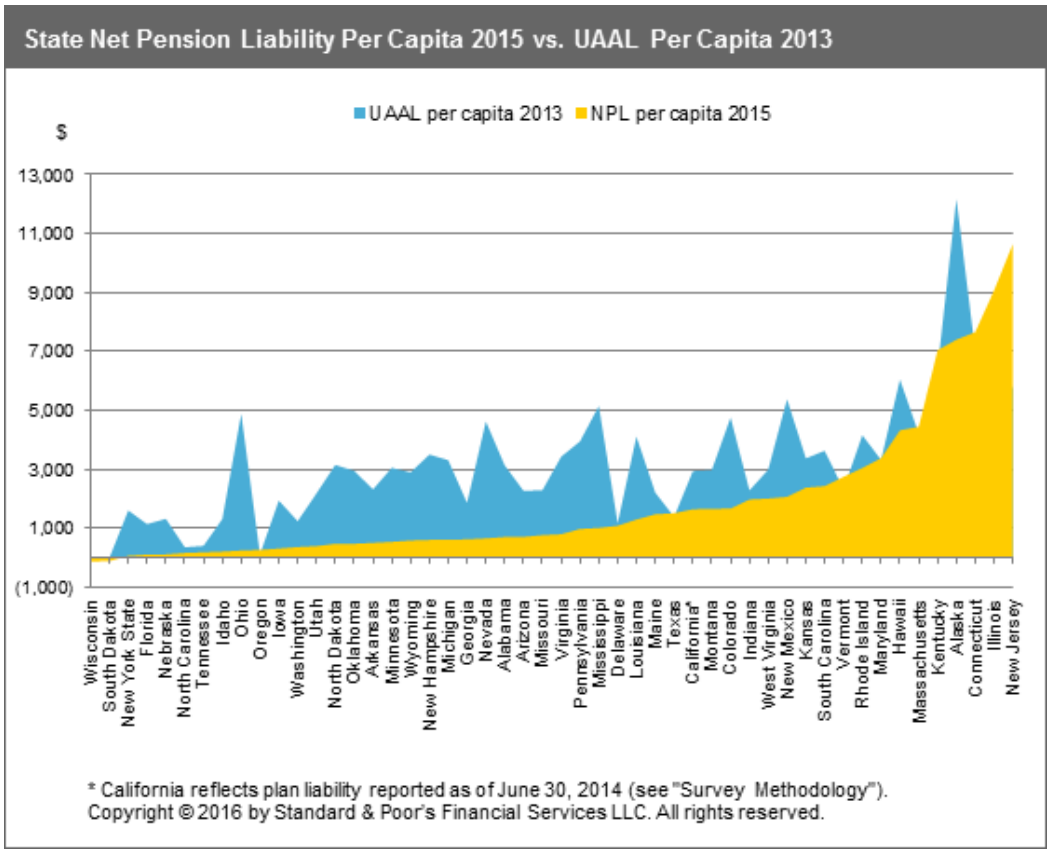
State reported share of net pension liability

Our 2015 survey incorporates the state's estimated share of the aggregate plan net pension liability under new GASB reporting standards.

For cost-sharing multiple employer plans, GASB 68 bases the reported share of the plan liability on the state's share of required pension contributions to the plan. Under previous GASB reporting standards, many states had reported the total plan liability for such plans, with no disclosure on the state's respective share of the liability. We believe the new GASB reporting standards provide for improved transparency and comparability of state-specific pension liabilities.

Incorporating the state's proportionate share of the net pension liability in this year's survey, we found that the unfunded pension liability per capita declined significantly for most states when compared to the reported total UAAL per capita under previous GASB accounting using 2013 valuations. However, New Jersey, Illinois, Connecticut, Kentucky, and Massachusetts are examples of states with a high net pension liability per capita exceeding $3,500 which grew compared to the UAAL per capita reported in last year's survey.

Chart 4



GASB 67 And 68 Reporting

What's new	What survey data shows	What to expect
Under new reporting standards, pension plans use a market valuation of assets at the measurement date rather than actuarially derived pension asset valuation. Only a handful of pension plans projected a future depletion of assets and used a lower assumed discount rate (or blended rate) to estimate their liabilities for GASB reporting. New reporting standards also provide disclosure on the state's proportionate share of the pension liability for cost-sharing pension plans.	States' pension funded ratios generally improved in fiscal 2014 due to strong market returns and compared to reported actuarially smoothed ratios in the previous year, although fiscal 2015 funded ratios were generally lower. Certain New Jersey, Texas, and Kentucky pension plans adopted a blended assumed discount rate which caused net pension liabilities to increase under new GASB reporting. Most states' reported share of net pension liability reflected lower liabilities overall than previously reported.	Future plan ratios and NPLs will be more volatile due to market valuation. Reported pension liability estimates could grow if more plans project future asset depletion dates and adopt blended rates. The state's share of liability will move with fluctuations in the plan's reported NPL, although the percentage share of the plan's liability for most states should not fluctuate significantly from year to year, absent significant reform.

Measuring Funding Progress

Reported pension liabilities are estimates of a long-term liability that needs to be managed over time to avoid significant future costs and credit pressure. Under the previous GASB 25 and 27 standards, GASB required the calculation of the annual required contribution (ARC), which had been used as a barometer of a state's progress and commitment to funding its long-term liability. The ARC represented the employer's cost of retirement benefits earned by employees in the current year and the amount needed to amortize any existing unfunded accrued liability over a period not to exceed more than 30 years. And, in general, we found that state plans that had a history of calculating pension contributions on an actuarial basis and regularly making pension contributions that met the ARC performed better than those that had not. Although GASB 67 and 68 accounting standards no longer require the calculation of an ARC, we understand most plans have not materially changed their funding policies since the implementation of GASB 67 and 68. Plans that had previously used an ARC-based funding policy now disclose an actuarially determined contribution (ADC) which is essentially the same as the ARC calculation.

However, actuarial assumptions used for funding policies won't align with assumptions used to derive liability estimates for GASB reporting purposes. Funding policies for most plans generally use an actuarial valuation of assets,

smoothing market returns over a longer period, to help provide a more stable and predictable unfunded liability estimate and annual contribution target than otherwise achievable with year-to-year market valuation of assets. Furthermore, the ARC's effectiveness at reducing the overall liability is only as good as the assumptions used to calculate it. That is, required contribution amounts necessary to demonstrate progress in plan funding could be greatly underestimated depending on actuarial assumptions behind the respective funding policies, including assumed amortization methods.

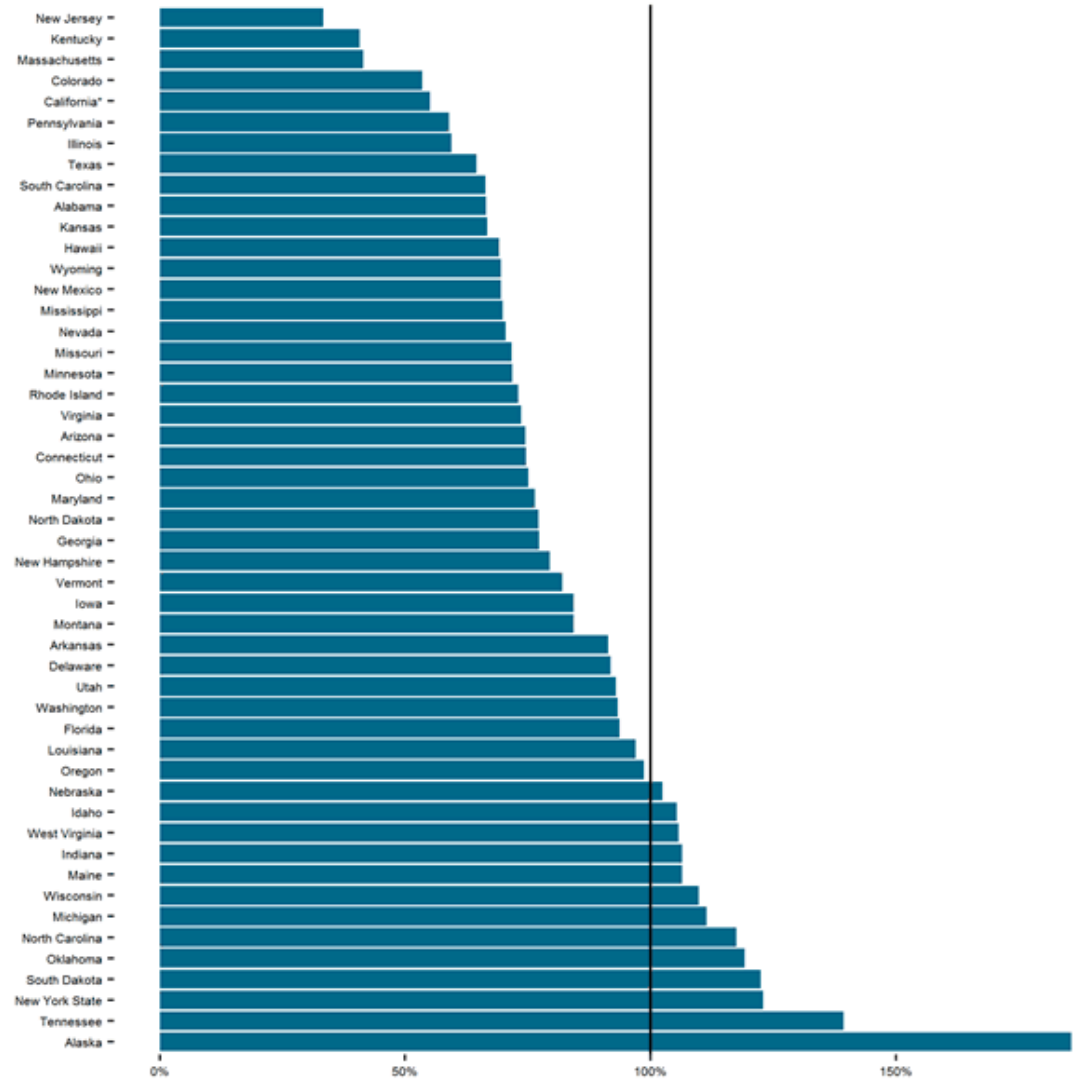
In our view, states that are consistent in funding required contributions based on funding policies that use conservative actuarial assumptions demonstrate an overall commitment and a path forward toward funding the estimated long-term liability. Furthermore, we believe new reported accounting measures can also provide clues on whether total annual plan contributions are making progress in funding the long-term estimated liability. Chart 5 compares total annual plan contributions to certain costs driving the annual change in the net pension liability. We believe there is likely some amount of funding progress if the annual plan contributions cover (1) service cost (the present value of benefits earned by participants in the year) (2) a portion of the annual total interest cost related to pension liabilities unmatched by plan assets, and (3) some amortization of the beginning net pension liability. The chart reveals that, on the whole, plan contributions for only about 25% of the states are covering these annual costs for the most recently reported year.

Aside from Alaska, which made a large non-recurring contribution to its pension plans in fiscal 2015, South Dakota, Tennessee, New York, Wisconsin, and North Carolina show strong progress in annual pension funding and are also notably states that have ranked among those the highest pension-funded ratios in our recent pension surveys.

Interestingly, Oklahoma plans showed strong progress in funding certain annual costs as of the most recent plan reports even though Oklahoma's pension funding is based on the dedication of certain revenues to fund pensions and does not directly correlate to an actuarially determined contribution. We note that prior to fiscal 2012, Oklahoma had funded its pensions at levels that were less than 70% of the ARC. However, pension reform efforts eliminated the cost of living adjustment (COLA) and reduced the state's liability, bringing the ARC closer in line with the revenue stream dedicated to fund it. Over the past four years, Oklahoma's contributions exceeded the ARC on an aggregate basis with overfunding of some plans and underfunding of others. This, however, could turn out to be temporary as the funding formula is driven by economically sensitive revenues, does not have an actuarial basis and does not adjust to increases in estimated liability.

The chart also reflects that New Jersey plans funded only 33% of the annual cost measures. This is likely to continue after the New Jersey Supreme Court ruled in June 2015 that the state's pension contributions are not constitutionally protected. Additionally, in August, state legislators failed to put a voter referendum on the November ballot for a constitutional amendment that would have required the state to increase its pension contributions.

Chart 5
Total Plan Contributions Compared To Accounting Measures For Plan Funding Progress

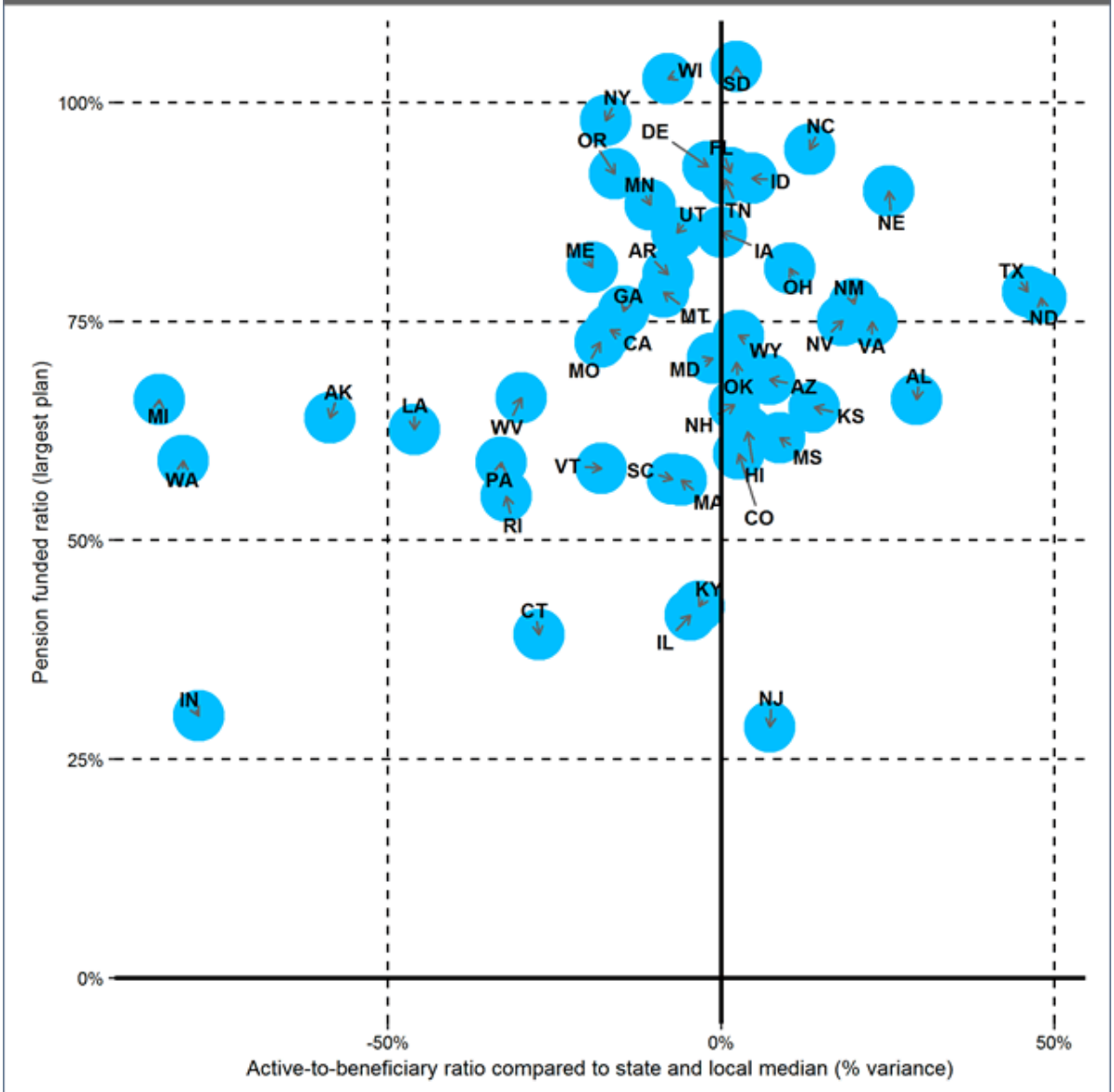


Assumptions matter

There are a multitude of assumptions behind the liability estimates and funding policies. These assumptions – including those relating to the rate of return, amortization methods, mortality rates, benefit growth, plan characteristics, and more -- drive a plan's estimated long-term pension liability. Incorporation of updated demographic and economic assumptions from regular experience studies are a sign of proactive plan management. A plan that significantly lags in its response to emerging long-term economic and demographic trends could fall behind in its funding, causing more significant cost increases in the future.

Plan characteristics and demographic makeup are also important in analysis of future pension pressures. Chart 6 reflects the active-to-beneficiary ratio for the largest state plans as it relates to the 1.5 median ratio reported by the U.S. Census Bureau for all state and local plans. Plans with relatively low active members compared to beneficiaries and without a strong funded ratio of pension assets to cover future benefits could face significantly greater challenges to cover future contributions as the base of contributing members shrinks.

Chart 6
Largest State Plans: Active To Beneficiary Ratios And Funded Status



Largest plan funded ratio as of most recent plan report. Indiana's pre-1996 Teachers Retirement Fund is a closed plan that the state funds on a pay-as-you-go basis.

Pension Reform: A Mixed Bag

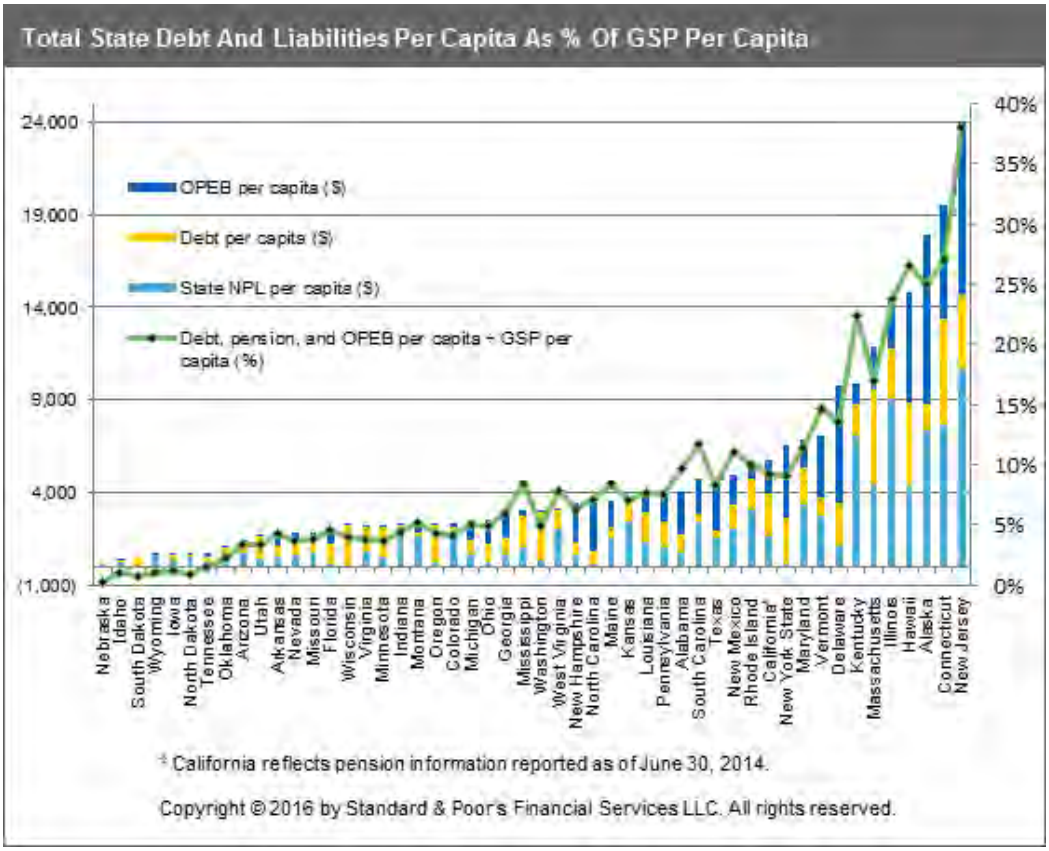
Some states have implemented pension reform successfully, while other state pension reform initiatives have met with legal roadblocks. The legal and political environment for each state differs and not all states have tested pension reform in court. Whereas the Illinois Supreme Court decision to overturn the state's 2013 pension reform has contributed to mounting budgetary stress and credit deterioration for Illinois, many states have demonstrated successful pension reform upheld in court or through settlements. Reform in Maine and Maryland in 2011 reduced COLA for current employees. In 2015, Texas passed legislation to increase active employee contributions to the Employees Retirement System. While such examples reflect successful reform for existing employee benefits, other states have focused on reducing benefits for new hires. In 2015, West Virginia established a new benefit tier for several plans which reduced benefits and required higher employee contributions for new hires. Nevada's 2015 legislature also established a new benefit tier for the Public Employees' Retirement System and reduced benefits for new hires. In late 2015, South Dakota's retirement system approved reform that adopts characteristics of a hybrid plan for new hires.

Although New Jersey's pension liabilities still remain severely unfunded, in June 2016, the New Jersey Supreme Court ruled in favor of New Jersey's 2011 law that froze COLAs, which otherwise could have led to an even higher pension liability. In August 2016, a California court of appeal ruling allowed adjustments to existing benefits for CALPERS municipal employees which seems to contradict a longstanding State Supreme Court decision (the "California Rule") and could imply more flexibility for future pension reform in the state. However, it is still too early to tell whether the case will be upheld upon appeal to the State Supreme Court.

According to the National Conference of State Legislatures, 44 states introduced 1,132 bills that related to pensions in 2016 compared to a total 1,101 bills introduced (by 50 states) in 2015. While more bills were introduced, only 177 pension related bills were enacted in 2016 compared to 252 in 2015 and 302 in 2014. Despite an apparent slowdown in enacted reform in the previous couple of years, we expect GASB reporting, increased attention to weaker market returns over the past two years, and increased calls from market participants for reducing assumed rates of return, will make it more likely that most states will resume efforts for pension reform as a means of managing rising liabilities and contributions.

Absent material pension reform, liability estimates will generally grow with experience trends. We believe lower market returns and rate of return assumptions could increase budgetary costs or strain a state's commitment to meeting its required long-term pension contributions. To the extent plans cannot demonstrate a history of meeting assumed projected contributions, we could see reports of asset depletion and calculation of higher liability using a blended assumed discount rate under new GASB reporting standards. Thus, we expect pension liabilities will continue to grow as a component of a state's overall liability profile and could pose significant public policy and funding challenges for many states. How states manage these liabilities both on an annual basis and in the long term will remain important credit factors in our review of state governments' total debt and liabilities.

Chart 7



U.S. States' Pension Liabilities And Ratios

State	Funded ratio (%)	Vs. last year (GASB 67)	NPL ($ mils.)	NPL per capita ($)	Debt, pension, and OPEB per capita ($)	State's largest plan	GO rating/outlook
Alabama	67.0	Lower	3,457	711	4,088	AL ERS	AA/Stable
Alaska	67.5	Higher	5,468	7,405	17,887	AK PERS	AA+/Negative
Arizona	63.2	Lower	4,892	716	1,420	AZ SRS	AA/Stable
Arkansas	82.4	Lower	1,533	515	1,758	AR PERS	AA/Stable
California*	75.0	NA	64,631	1,651	5,798	CA PERF	AA-/Stable
Colorado	60.0	NA	9,146	1,676	2,344	CO State Division	AA/Stable
Connecticut	49.4	Lower	27,511	7,660	19,484	CT SERS	AA-/Stable
Delaware	89.1	Lower	1,031	1,090	9,789	DE State Employees	AAA/Stable
Florida	92.0	Lower	2,299	113	2,017	FL RS	AAA/Stable
Georgia	80.7	Lower	6,462	632	2,927	GA ERS	AAA/Stable
Hawaii	62.4	Lower	6,197	4,328	14,806	HI ERS	AA/Positive
Idaho	91.3	Lower	356	215	402	ID PERS	AA+/Stable
Illinois	40.2	Lower	116,760	9,078	14,320	IL TRS	BBB+/Negative
Indiana	60.3	Lower	13,133	1,984	2,261	IN TRF pre-1996	AAA/Stable

U.S. States' Pension Liabilities And Ratios (cont.)

State	Funded ratio (%)	Vs. last year (GASB 67)	NPL ($ mils.)	NPL per capita ($)	Debt, pension, and OPEB per capita ($)	State's largest plan	GO rating/outlook
Iowa	85.1	Lower	1,003	321	677	IA PERS	AAA/Stable
Kansas	65.2	Lower	6,940	2,383	3,616	KS PERS	AA-/Stable
Kentucky	37.4	Lower	31,184	7,046	9,845	KY Teachers	A+/Stable
Louisiana	63.8	Lower	6,082	1,302	3,994	LA LASERS	AA/Negative
Maine	81.3	Lower	1,970	1,481	3,574	ME PERS	AA/Stable
Maryland	68.8	Lower	20,316	3,382	6,876	MD TRPS	AAA/Stable
Massachusetts	61.5	Lower	30,248	4,451	11,912	MA MTRS	AA+/Negative
Michigan	66.5	Lower	6,128	618	2,408	MI SERS	AA-/Stable
Minnesota	78.8	Lower	2,998	546	2,252	MN SERF	AA+/Positive
Mississippi	61.8	Lower	3,045	1,018	3,013	MS PERS	AA/Stable
Missouri	66.9	Lower	4,706	773	1,805	MO MSEP	AAA/Stable
Montana	74.5	Lower	1,720	1,665	2,292	MT PERS+DBRP	AA/Stable
Nebraska	88.8	Lower	230	121	129.55	NE Schools	AAA/Stable
Nevada	75.2	Lower	1,919	664	1,793	NV PERS	AA/Stable
New Hampshire	65.4	Lower	813	611	3,436	NH RS	AA/Stable
New Jersey	37.8	Lower	95,396	10,648	24,065	NJ TPAF	A/Negative
New Mexico	70.6	Lower	4,324	2,073	4,916	NM PERA	AA+/Negative
New York State	98.1	NA	1,471	74	6,544	NY ERS	AA+/Stable
North Carolina	94.6	Lower	1,701	169	3,480	NC PERS	AAA/Stable
North Dakota	70.4	Lower	364	481	679	ND PERS	AA+/Stable
Ohio	78.8	NA	2,917	251	2,536	OH PERS	AA+/Stable
Oklahoma	80.3	Lower	1,888	483	1,025	OK Teachers	AA+/Negative
Oregon	91.9	Lower	1,092	271	2,296	OR PERS	AA+/Stable
Pennsylvania	57.6	NA	12,565	981	4,072	PA SERS	AA-/Negative
Rhode Island	55.5	Lower	3,223	3,051	5,389	RI ERS - State	AA/Stable
South Carolina	57.9	Lower	11,920	2,434	4,765	SC RS	AA+/Stable
South Dakota	104.1	Lower	(94)	(109)	411.39	SD RS	AAA/Stable
Tennessee	91.3	Lower	1,287	195	717	TN CSHEPP	AAA/Stable
Texas	75.6	Lower	41,610	1,515	4,812	TX TRS	AAA/Stable
Utah	88.5	NA	1,204	402	1,655	UT URS	AAA/Stable
Vermont	65.4	Lower	1,722	2,750	7,084	VT Teachers	AA+/Stable
Virginia	74.6	Lower	6,757	806	2,216	VA VRS	AAA/Stable
Washington	86.8	Lower	2,668	372	3,019	WA PERS 1	AA+/Stable
West Virginia	76.9	Lower	3,711	2,012	3,114	WV TRS	AA-/Stable
Wisconsin	102.7	Lower	(687)	(119)	2,104	WI WRS	AA/Stable
Wyoming	80.1	NA	347	592	642	WY PERS	AAA/Negative
Total			577,564				
Median	74.6		3,134	790	3,016		
Average	73.2		11,551	1,870	4,849		

Ratings as of Sept. 9, 2016. *California reflects pension information reported as of June 30, 2014.

Survey Methodology

Our calculation of pension liabilities was derived from pension plan and state CAFRs reporting under GASB 67/68 standards, GASB 67 consultant reports, and GASB 68 allocation reports currently available to us. We have combined information across multiple pension plans for each state to calculate the state's aggregated plan net position to the total pension liability (pension funded ratio) and funding progress measures. We use cost-sharing multiple employer pension plan CAFRs or GASB 67 reports released within the state's fiscal year and use the state's proportionate share of plan liabilities to calculate the state's net pension liability.

All states except for Alabama and New York have released a CAFR using GASB 68 reporting standards, which incorporates disclosure on the state's proportionate share of cost-sharing pension plans. To estimate Alabama's and New York's respective shares of the pertinent cost-sharing plans' net pension liability, we use the most recent plan GASB 68 allocation reports. Although most states report their proportionate share of respective plan net pension liabilities as of fiscal 2014, we assume the same percentage share applied to fiscal 2015 plan NPLs. In deriving the estimated state portion of the liability for some cost-sharing multiple employer plans, we include a portion of plan liabilities in addition to those reported in the state's CAFR if we expect the state will likely continue to make pension contributions on behalf of other plan employers, even if such contributions are not legally required or do not flow directly to the plan.

Most cost-sharing multiple employer pension plans in which states participate have reported two years of pension plan data under GASB 67 through each respective state's fiscal 2015 year-end. However, given varying reporting dates, some plans do not have a conforming two-year history under GASB 67 reporting standards; therefore the following states are not included in Chart 2: California, Colorado, New York, Ohio, Pennsylvania, Utah, and Wyoming.

Most states' single plan or agent employer plans are relatively small and updated GASB reported information is available only as of fiscal 2014 in the states' fiscal 2015 CAFRs. Given the relative size of these plans, if updated information is not available for fiscal 2015, we carry forward fiscal 2014 net pension liabilities to fiscal 2015 to maintain relative comparability between years. California is an exception in that its share of NPL in its largest plan, CALPERS PERF A, represents more than half of the state's estimated NPL. CALPERS PERF A is an agent multiple-employer plan which only reports under updated GASB standards as of fiscal 2014 in the state's fiscal 2015 CAFR. We therefore report on California's ratios as of fiscal 2014.

Chart 5 uses the following calculation across all state plans to estimate annual plan funding progress: Total employer and employee plan contributions ÷ the sum of service cost + total interest cost x (1 – average plan funded ratio) + (beginning plan net pension liability ÷ 30). If the aggregate beginning unfunded pension liability across plans is negative, beginning plan net pension liability ÷ 30 would be treated as zero. Likewise, for funded ratios at or above 100%, the interest cost factor would be zero.

Charts 1 and 6 reflect information specific to the largest pension plan in which the state participates (see table 1), measured by its share of the state's total estimated net pension liability.

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September 22, 2016

The Honorable Eleanor Holmes Norton
United States House of Representatives
2136 Rayburn House Office Building
Washington, DC 20515

Dear Congresswoman Norton:

On behalf of a public pension fund that invests assets for the District of Columbia firefighters, police officers and teachers, the District of Columbia Retirement Board (the Board) urges you to vote against H.R. 5983, the "Financial CHOICE Act of 2016." Private equity investments comprise a small but meaningful portion of our portfolio and have been a valuable contributor to our returns. Private equity structures, however, are complex and heavily negotiated. To steward these investments requires access to information to ensure that the Board has the transparency needed to better understand the costs and the ability to mitigate or address any conflicts of interest. The Board benefits from the SEC's oversight of private equity fund managers, in that the SEC has access to information that individual institutions may not. Consequently, our ability to extract maximum value from our investments in private equity would be undermined by the passage of this bill. The sweeping changes suggested would strip away the investor protections that have been crucial in helping us to achieve improved transparency and stronger alignment of interests in private equity.

In particular, we are concerned that this bill would:

- Exempt private equity funds from registration with the SEC, and more importantly, periodic examinations of internal protocols and practices vis à vis investors
- Reduce the records and reports that private equity funds must maintain for regulator and investor review
- Reduce regulators' access to information and their ability to ensure fair treatment of investors

Over the past four years, the findings resulting from the SEC's investigations have been a helpful complement to our own due diligence and monitoring efforts. Likewise, the recordkeeping requirements that would be eliminated by this bill yield information that is very useful in monitoring our own investments. The removal of these two features (Title IV Subtitle B Section 450 and 451) in particular would significantly damage the quality of governance in the private equity industry.

As an institution that utilizes the assistance of professional investors in these assets, we believe the Financial CHOICE Act Subtitle B of Title IV would be detrimental to the beneficiaries we serve and to the financial industry more broadly. At the urging of the ultimate participants of these investments, institutions like ours are working diligently to get more information, not less. It is our belief that this bill, and others like it, such as HR 5424, the Investment Advisers Modernization Act of 2016, will move the industry in the wrong direction.

Please consider the importance of regulatory oversight to investors and vote against this bill.

Sincerely,

Eric O. Stanchfield

Eric Stanchfield
Executive Director

Benefits Department
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TO: **BOARD OF TRUSTEES**

FROM: **EDWARD SMITH, CHAIR**

DATE: **OCTOBER 20, 2016**

SUBJECT: **BENEFITS COMMITTEE REPORT**

The Benefits Committee did not meet during the month of September. The following report reflects Benefits Department activities and projects that occurred since the last report.

Retirement Modernization Project - Electronic Transmission of HR Data to STAR

With the early November implementation date on the horizon, the DCRB Benefits Retirement Services Unit is wrapping up final User Acceptance Testing of the Data Management System. Test results, thus far, are positive. Minor hiccups encountered have been readily addressed. Where necessary, workarounds have been developed. Per the Project Plan, Treasury will conduct end-to-end testing during the last half of October. The targeted "Go Live" date is Monday, November 7, 2016.

Retirement Benefit Statement Project

The Benefits Department continues to move forward with the first issuance of benefit statements to members. The test group of 170 FEMS members has been selected and will receive an email next week requesting their participation in our pilot program. Ninety percent of the test group is eligible for retirement within five years.

2016 Health Benefits Open Enrollment

Federal and District Health Benefits Open Season will begin on Monday, November 14th and end on Monday, December 12, 2016. Notification will be provided to members on the November earnings statements. DCRB will again host four open season fairs this year with tentative dates December 1 & 2 and December 8 & 9 on the ML level of this building. Similar to last year's Open Enrollment, DCRB is minimizing the manual process by use of technology by electronically feeding the health benefit updates from the STAR system to Office of Personnel Management for the participants in the federal program.

Term Vested Project

As you know DCRB has a large number of members (vested and nonvested) who have left District employment with contributions remaining in the Police/Fire and Teacher

Retirement Funds The Benefits Department has developed a policy and procedures to reduce the number of lost members by communicating with these members as they leave. Our records reflect that over 500 Plan members left the District during 2015-2016.

On October 6, 2016, the Benefits Department mailed letters to113 non-vested Teachers and informed them about their refund options. The first mailing included a customized letter, refund brochure, refund application, beneficiary form, and information on tax treatment of distributions. Additional mailings will be occurring within the next quarter. Benefits will also post the communication to terminated employees on the DCRB website.

Equalization Increases

In accordance with D.C. Code § 5-745, Tier 1 Police/Fire Plan members who retired prior to February 15, 1980 are eligible for equalization pay in the same increase percentage active-duty police officers and firefighters. Since active union and nonunion police officers and nonunion firefighters received an FY 2017 pay increase of 3% on October 2, 2016, equalization increases will be paid to eligible retired union and nonunion police officers and retired nonunion firefighters, effective November 1, 2016 and payable December 1, 2016.

Because active-duty union firefighters are still in the process of negotiating a bargaining agreement, retired union firefighters will not receive an equalization increase (if any) until the provisions of the bargaining agreement are known.

Benefits Department Monthly Statistics

Activity	September	August	July
Retirement Claims Received	119	154	192
Processed Retirements	167	117	100
Average Processing Days	52	54	68
Telephone Calls	2695	2898	2434
Walk-in Customers	124	131	102
Scanned Documents	10,643	12,378	11,502
QDROs Approved	2 final	3 final	none
Purchase of Service	16 ($279,864.32)	12 ($153,888.40)	2 ($1,063.28)

You will find more details of the Benefits Department statistics in the attached reports.

MEMBER SERVICES CUSTOMER SATISFACTION SURVEY
September 2016

Background

The reported survey outcomes are the results of the September 2016 Member Services Customer Satisfaction Survey. The data collected are from active and retired members of the District of Columbia Police Officers and Firefighters' and Teachers' Retirement Plans, their survivors and beneficiaries. The purpose of the survey is to gather and measure the customer experience, gaging their satisfaction in an effort to improve our service to them, as necessary.

Survey Objective

The resulting feedback will be used to:

- Increase member satisfaction and confidence
- Deliver actionable data to decision-makers
- Reduce caller and in-person wait times for service
- Set reasonable service expectations

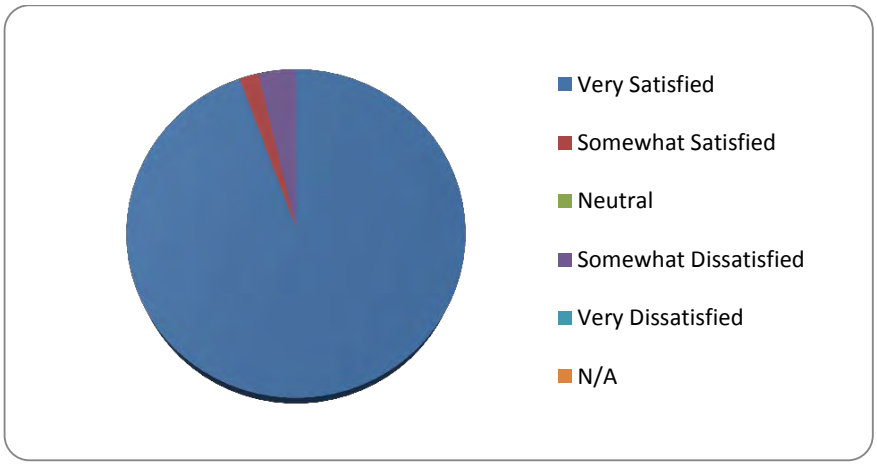
Methodology

- This month, survey participants were Plan members who made onsite visits to the DCRB member Service Center and members who contacted the center by email to the dcrb.benefits@dc.gov address. Some members arrived after having scheduled an appointment; others came in for assistance with updating their member information. The survey participants were randomly selected.

Participants

- 333 surveys were sent.
- 56 responses were received from members.

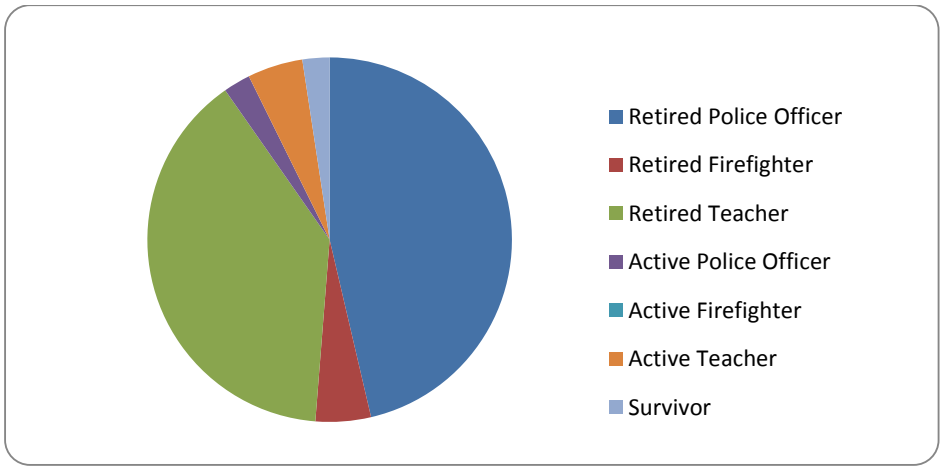
Overall DCRB Member Satisfaction



MEMBER SERVICES CUSTOMER SATISFACTION SURVEY
September 2016

Overall, how satisfied are you with the member service provided by DCRB?		
Answer Options	**Response Percent**	**Response Count**
Very Satisfied	94.4%	51
Somewhat Satisfied	1.9%	1
Neutral	0.0%	0
Somewhat Dissatisfied	3.7%	2
Very Dissatisfied	0.0%	0
N/A	0.0%	0
answered question		54
skipped question		2

Membership Type



Knowledge and Skills

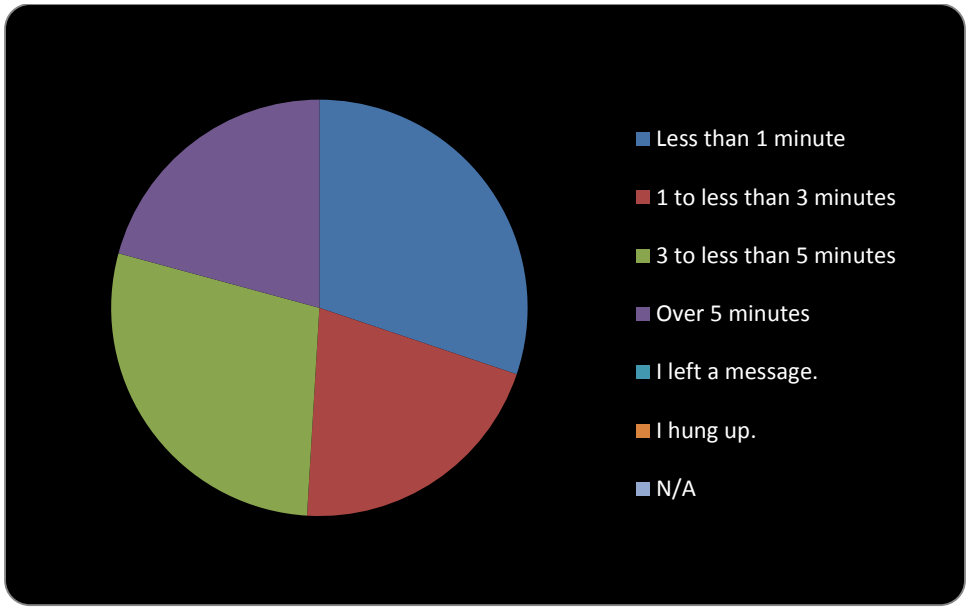
How satisfied were you with how the representative addressed your problem/inquiry?						
Answer Options	**Strongly Agree**	**Agree**	**Neither Agree/Disagree**	**Disagree**	**Strongly Disagree**	**Response Count**
Had the right information.	52	0	0	2	0	54
Understood your questions.	51	1	0	1	0	53
Provided clear answers.	51	1	0	1	0	53
Answered your questions.	51	0	0	2	0	53
Appeared well organized.	51	1	0	1	0	53
					answered question	54
					skipped question	2

MEMBER SERVICES CUSTOMER SATISFACTION SURVEY
September 2016

Reason for Contact

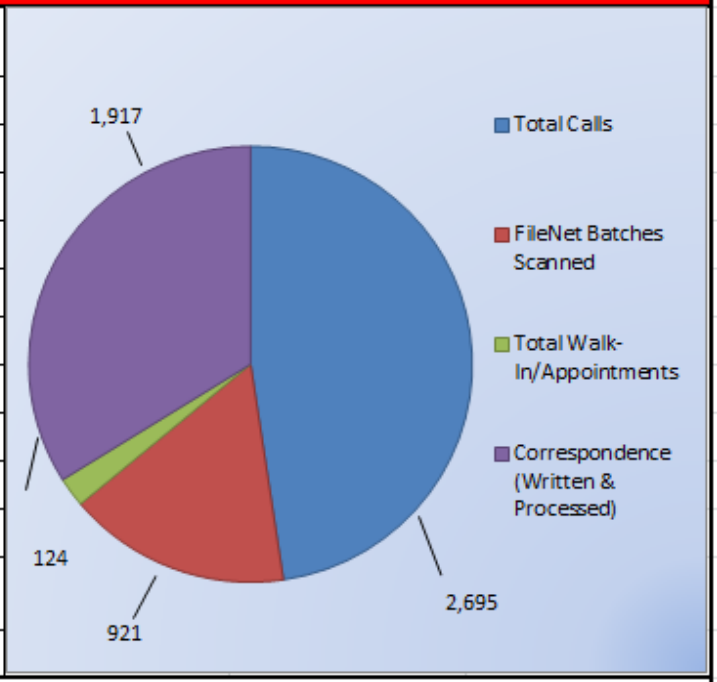
What was the main reason you contacted the DCRB Benefits Department?		
Answer Options	**Response Percent**	**Response Count**
Name/Address Change	13.5%	5
Direct Deposit	2.7%	1
Health/Life Insurance	24.3%	9
Redeposit/Purchase of Service	0.0%	0
Student Certification	0.0%	0
Beneficiary Change	21.6%	8
Retirement	24.3%	9
Tax Withholding Election	10.8%	4
Refund	5.4%	2
Death of Annuitant	8.1%	3
Disability	0.0%	0
I did not contact DCRB.	0.0%	0
Other (please specify)		16
	answered question	**37**
	skipped question	**19**

Contact Wait Time



DCRB Member Services Center Statistics for September 2016

Call Center Statistics	
Total Calls	**2,695**
Inbound Calls	1,617
Outbound Calls (Voicemails & Follow-up calls)	1,078
Average Talk Time	*3:46 minutes*
Average Caller Wait Time	*2:19 minutes*
Total Walk-In/Appointments	**124**
FileNet Batches Scanned	**921**
Documents Pages Scanned	10,643
Correspondence *(Written & Processed)*	**1,917**
Email & Fax	333
Processed Documents (EFTs, address & name changes, tax forms, 1099s, & 2809s , etc.)	1,272
Total	**5,657**



Top 3 Contact Trends	
Death Benefits/Notification	1. Notification of a death of a member/annuitant 2. Change in Beneficiaries for Life Insurance 3. Status of Benefit payment
Health Insurance	1. Questions regarding Open Enrollment dates and 2017 premiums 2. Report enrollment in Medicare Parts A & B 3. Transition from Active to Retirement *(Transfer-In's)* 4. Reduction in coverage *(Self + One to Self Only)*
Tax	1. 1099-R requests 2. Tax withholding changes 3. Requests for state and federal tax forms

Member Services August Statistical Comparison by Year

	2015	2016	Comments
Walk-Ins/Appointments	117	124	
Total Calls *(includes voice mails)*	1,936	2,695	
Emails	318	202	
Total	**2,371**	**3,021**	

Member Services Center 9_2016

RETIREMENT CASE PROCESSING - MONTHLY REPORT

OCTOBER 1, 2016

CASES AVAILABLE FOR PROCESSING	CASES RECEIVED (but may not have been ready for payment)	CASES PROCESSED	CASE TYPE	PLAN		
				Fire	Police	Teacher
47	20	27	Beneficiary (One-Time Payments)	2	7	18
6	0	6	Beneficiary of Survivor	0	6	0
11	9	2	Deferred Annuity	0	1	1
1	0	1	Disability	1	0	0
1	0	1	Garnishment/Levy	0	1	0
2	0	2	Health Benefit Adjustments	1	0	1
87	38	49	Optional/Voluntary & Involuntary Annuity	1	16	32
2	0	2	QDRO/QMSCO	0	2	0
24	10	14	Survivor Annuity	2	10	2
1	0	1	Student Certifications	1	0	0
9	0	9	Annuity Adjustments	0	7	2
12	0	12	Octo Review – Monetary & Non-Monetary Adjustments	5	6	1
8	0	8	POST-56 Adjustments	2	6	0
4	0	4	Disability Income Project Adjustments	2	2	0
1	0	1	Income Verification Project	0	1	0
70	42	28	Refund of Contributions**	0	4	24
286	119	167		17	69	81
			Gross Dollar Value of Refunds**	$0	$117,842.51	$576,968.08

RETIREMENT CASE PROCESSING REPORT – Prepared by S. Treadwell, Retirement Services Manager

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TO: BOARD OF TRUSTEES

FROM: LYLE BLANCHARD, CHAIRMAN

DATE: OCTOBER 20, 2016

SUBJECT: LEGISLATIVE COMMITTEE REPORT

The following report reflects activities of interest since the September Board Meeting:

COUNCIL OF THE DISTRICT OF COLUMBIA

B21-827, "Senior Law Enforcement Officer Amendment Act of 2016"

This proposed bill would allow the Metropolitan Police Department's Chief of Police to rehire retired detectives and sergeants at higher pay grades than allowed under the District's salary offset law in order to retain veteran, experienced officers.

Status: The Committee of the Judiciary held a public hearing on this bill on October 17, 2016.

B21-847, "Law Enforcement Career Opportunity Amendment Act of 2016"

This proposed bill would raise the upper age limit for the Metropolitan Police Department's Cadet Program from 21 to 25 to expand program eligibility.

Status: The Committee of the Judiciary held a public hearing on this bill on October 17, 2016.

L21-160, "Fiscal Year 2017 Budget Support Act of 2016"

Title I, Subtitle L - Equity in Survivor Benefits Clarification Amendment Act of 2016

Amends the D.C. Spouse Equity Act of 1988 to preclude orders issued after an employee's or retiree's death.

Title III, Subtitle E - Fire and Emergency Medical Services Department Chief Officers Service Longevity Amendment Act of 2016

Provides longevity pay calculated based on annual rate of pay and total active service for non-union, active Assistant Fire Chiefs, Deputy Fire Chiefs and Battalion Fire Chiefs.

Status: The law, applicable October 1, 2016, became final on October 8, 2016.

October 20, 2016

Presentation to:

District of Columbia Retirement Board – 2016 Audit Kick-off

CliftonLarsonAllen

www.cliftonlarsonallen.com

Engagement Scope

- Audit of the DCRB's financial statements as of September 30, 2016
- Report on Internal Controls and Compliance (in accordance with Government Auditing Standards)
- Written Communications with the Board

Work Plan

- Audit to be conducted in accordance with governmental auditing standards generally accepted in the United States of America
- Phased Approach – Planning, Internal Control, Substantive and Reporting

Critical Audit Areas

- Investments
- Contributions
- Benefit payments
- Actuarial data

Critical Audit Areas – Actuarial Data

- AU section 500.08 - use of a management specialist (independent actuary, Cavanaugh MacDonald)
  - Evaluate the competence, capabilities and objectivity of the specialist
    - ◊ Confirm actuaries independence and accreditation
    - ◊ Prior experience with the actuaries
  - Obtain an understanding of the work of the specialist
    - ◊ Review the nature, scope and objectives of the work of the specialist
  - Evaluate the appropriateness of the work of the specialist
    - ◊ Census data testing
    - ◊ Review of the actuary report and compare key assumptions to pension and actuarial industry standards

Critical Audit Areas – Actuarial Data (*enhanced procedures)*

- The District's implementation of GASB 68 increases the risk and reporting relevance of the actuarial numbers. In response we will perform the following additional procedures:
  - ◊ Review the report issued by the independent actuary, Cavanaugh Macdonald, to evaluate the sufficiency and appropriateness of the their actuarial valuation.
  - ◊ Utilize data analytics in our review of the census data including enhanced testing of the active and retiree populations for completeness and accuracy.

Timing of Work

KEY MILESTONES	DATE
Planning	Completed in August
Understanding and Testing of Internal Controls	Completed in August
Substantive Procedures	November 2016
Final Audit Reports	December 2016

New Accounting Standard

- GASB Statement No. 72, *Fair Value Measurement and Application*
- Discussed in detail at the July 2016 audit committee meeting
- Issued February 2015
- Effective for periods beginning after June 15, 2015 (**effective September 30, 2016**)
- Addresses accounting and financial reporting issues related to fair value measurements
- This approach has been used in for-profit sector since FAS 157 (issued Sept 2006)

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District of Columbia Retirement Board
Conference Travel Report for Trustees and Staff

Name(s): Mary A. Collins

Conference Name: CII Fall 2016 Conference

Sponsor(s): CII

Location: Chicago Ill **Date(s):** 9/28/16 - 9/30/16

Purpose: Corporate Governance

Feedback:

1. Who would benefit most from this conference (e.g., staff, new trustees, experienced trustees)?

   Anyone in the Pension industry expecially Trustees & Staff. Would benefit most.

2. Would you recommend this conference to others? Yes ☒ or No ☐

3. Were the presentations readily understood by the attendee or did they seem to be aimed at other professionals in the audience?

   Presentations were understood. Handout Were great in aiding presentations. Ex. "Greenwich Round table" "Code of Conduct for members of a Pension scheme Governing Body" and folder by Liuna. These and more materials will be Placed in the DCRB Library.

4. Please list any ideas or insights you learned at this conference that you think would further the goals and objectives of DCRB.

(1) The 21st Century Investor listed 10 steps that will help institutional owners sustain an investment course that will benefit the fiduciary duties of trustees.

(2) There was good interaction of climate Change and the role of trustees in Compliance & associated risk.

(3) New York has a Carbon free mandate that DCRB should follow-up on.

(4) The commitment tech. versity was quite informative

5. Other Comments:

Training in "Code of Conduct for members of a Pension Scheme Governing Body" Booklet by CFA Institute (Interactive Session) "Mastering Basic Investment Skills

Can access CFA Research Foundation for content for information

In 2000 - Tools for portfolio Management was a stage of investmenting.

UAW RETIREE
Medical Benefits Trust

DIVERSITY & INCLUSION IN THE CAPITAL MARKETS

September 29, 2016

Hosted By: S.E.I.U
2016 CII Fall Conference - Chicago, IL

Meredith Miller, Chief Corporate Governance Officer
UAW Retiree Medical Benefits Trust
Phone: (734) 887-4964
Email: mamiller@rhac.com

Examples of Diverse Candidate Search Language for Nominating & Governance Committee Charters*

Intel (Corporate Governance and Nominating Committee Section)

"The Committee reviews with the Board from time to time the appropriate skills and characteristics required of Board members in the context of the current make-up of the Board; this assessment of Board skills, experience, and background includes numerous diverse factors, such as independence; understanding of and experience in manufacturing, technology, finance, and marketing; international experience; age; and gender and ethnic diversity, which includes its commitment to actively seek women and minority candidates for the pool from which board candidates are chosen."

http://files.shareholder.com/downloads/INTC/2621567126x0x296281/88E8EEFB-D387-4A28-982E-3430CA17C541/2008_01_BOD_Charter_Corporate_Governance_Committee.pdf

Costco (Corporate Governance Guidelines Section)

"The Company is committed to a policy of inclusiveness. In performing its responsibilities for identifying, screening and recommending candidates to the Board, the Committee should: ensure that candidates with a diversity of ethnicity and gender are included in each pool of candidates from which Board nominees are chosen; and seek diverse candidates by including in the candidate pool (among others) individuals from nonexecutive corporate positions and non-traditional environments."

http://phx.corporate-ir.net/phoenix.zhtml?c=83830&p=irol-govhighlights

Ecolab (Governance Committee Charter Section)

"The Board of Directors is committed to actively seeking out highly-qualified women and minority candidates for each search the Board undertakes. In identifying, evaluating and recommending director nominee candidates, the Committee will consider diversity of gender and ethnicity within the Board, the criteria set forth in (1) above, and such other factors as the Committee deems appropriate"

http://investor.ecolab.com/corporate-governance

EMC (Nominating and Governance Charter Section)

"The Committee, acting on behalf of the Board, will commit to actively identify and recruit diverse candidates, including women and minority candidates, as part of the search process for Board members."

http://www.emc.com/collateral/corporation/governance-charter.pdf

Home Depot (Policy on the Consideration and Evaluation of Candidates for Membership on the Board of Directors

"The Committee believes it is important to have Directors from various backgrounds and professions in order to ensure that the Board has a wealth of experiences to inform its decisions. Consistent with this philosophy, in addition to the minimum standards set forth above, the Committee is committed to including in each search candidates who reflect diverse backgrounds, including diversity of gender and

race. The Committee also seeks candidates who offer business and managerial experience and who demonstrate an understanding of financial statements and financial matters.

http://ir.homedepot.com/~/media/Files/H/HomeDepot-IR/documents/governance-documents/policy-on-consideration-and-evaluation-of-board-candidates.pdf

IDEXX Labs (Corporate Governance Guidelines Section)

"Selection of New Directors and Committee Members. Except where the Company is legally required by contract, bylaw, or otherwise to provide third parties with the right to nominate directors, the Governance Committee shall be responsible for (i) identifying individuals qualified to become Board members, consistent with criteria approved by the Board, (ii) recommending to the Board the persons to be nominated for election as Directors at any meeting of stockholders and the persons to be elected by the Board to fill any vacancies on the Board, and (iii) recommending to the Board the persons to serve on the various committees of the Board, including the Audit Committee, Compensation Committee, Governance Committee, and Finance Committee. Director nominees shall be considered for recommendation by the Governance Committee in accordance with these Guidelines, the policies and principles in its charter, and the criteria set forth in Attachment A to these Guidelines. The Company is committed to a policy of inclusiveness and as such when searching for new Board members, the Governance Committee should actively seek out highly qualified diverse candidates (including gender and ethnicity) to include in the pool from which Board nominees are chosen.

https://www.idexx.com/files/corporate/about-idexx/investor-relations/corporate-governance-guidelines.pdf

Stryker (Nominating Committee Charter Section)

"The Committee shall conduct the search for and identify individuals qualified to become members of the Board of Directors to fill new positions and vacancies on the Board of Directors. The Committee shall recommend to the Board the slate of director nominees for shareholder approval at each annual meeting. As part of this process, the Committee shall consult with Board members, management and others and shall give consideration to candidates recommended by shareholders. The Committee shall consider the background and reputation of potential nominees in terms of character, personal and professional integrity, business and finance experience and acumen, and their availability to devote sufficient time to Board duties and any other criteria established by the Board. The Committee is committed to creating a Board with a diversity of expertise, experience, gender, and ethnicity. The Committee, acting on behalf of the Board, will commit to actively identify, recruit and advance diverse candidates, including women and minority candidates, in the search process. In considering whether to recommend a director for reelection, the Committee shall consider the individual's past attendance at meetings and participation in and contributions to the activities of the Board and committees thereof. The Committee shall specifically consider the effect of any change in a director's principal occupation or business association from that held when he or she became a member of the Board and the appropriateness of continued membership under the circumstances."

http://www.stryker.com/enus/corporate/ForInvestors/CorporateGovernance/Charters/GovernanceNominatingCommitteeCharter/index.htm

Whole Foods (Corporate Governance Principles, Board of Directors' Mission Statement & Role Definition)

"Director Qualifications. The Nominating and Governance Committee is responsible for reviewing annually with the Board of Directors the qualifications for membership on the Board of Directors. The Board believes that it is in the best interests of the Company and its shareholders to identify and select highly-qualified candidates to serve as directors and for the Board of Directors to be comprised of a diverse group of individuals with different backgrounds and perspectives. The Nominating and Governance Committee reviews director candidates in light of the Board membership qualifications and recommends candidates to the Board for election by the Company's shareholders at the annual meeting. The Committee considers nominations by Company shareholders that recommend candidates for election to the Board in compliance with the procedures described in the Company's proxy statement. The Committee also recommends candidates for appointment by the Board as necessary to fill vacancies and newly created directorships. All nominations or appointments of new directors must be approved by a majority of the independent directors.

The Company is committed to a policy of inclusiveness, and as such, in performing its responsibilities to review director candidates and recommend candidates to the Board for election, the Nominating and Governance Committee should:

- Ensure that candidates with a diversity of ethnicity and gender are included in each pool of candidates from which Board nominees are chosen;
- Seek diverse candidates by ensuring director searches include nominees from both non-executive corporate positions and non-traditional environments; and
- Review periodically the composition of the Board to ensure it reflects the knowledge, experience, skills, and diversity required for the Board to fulfill its duties."

http://s21.q4cdn.com/118642233/files/doc_downloads/governance_documents/Governance_Principles_Nov4_2014.pdf

Gentex (Selection Process for Board Candidates Section)

a) The Nominating and Corporate Governance Committee identifies director candidates based on the Position Profile: Member of the Board of Directors. (Per Restated Articles of Incorporation, the "Board of Directors shall consist of at least six (6), but not more than nine (9) members.")

b) The Chair of the Nominating and Corporate Governance Committee works with support from other members of the Nominating and Corporate Governance Committee, the Board, and senior management, and if appropriate, hiring a search firm, to identify director candidates. Shareholder recommendations will be considered if submitted in writing, together with appropriate biographical information to the Chairman of the Nominating and Corporate Governance Committee, c/o Corporate Secretary's Office, Gentex Corporation, 600 North Centennial Street, Zeeland, Michigan 49464. If a shareholder would like a nominee to be considered by the Nominating and Corporate Governance Committee for inclusion in the Company's proxy statement as a Board nominee, a written proposal should be submitted no later than December 31 with respect to the following year's Annual Meeting of Shareholders.

c) An initial slate of candidates that satisfy the specific criteria in the Position Profile and otherwise qualify for membership on the Board, are identified and presented to the entire Nominating and Corporate Governance Committee. As set forth in the Position Profile, consideration will be

given to gender, race, ethnicity, and country of origin of diversity. In order to ensure diverse candidates are considered and/or interviewed in each search, the Nominating and Corporate Governance Committee will avail itself of a variety of available resources to identify qualified candidates, including candidates from non-executive positions and non-traditional environments.

d) The Nominating and Corporate Governance Committee conducts appropriate interviews of the most qualified candidate(s) as appropriate.

e) The Nominating and Corporate Governance Committee meets to consider and approve the most qualified candidate(s).

f) The Nominating and Corporate Governance Committee selects and/or recommends the most qualified candidate(s) for full Board and/or independent director approval, as appropriate.

http://ir.gentex.com/getattachment/88d97a7f-16a6-4e34-9c8f-1f867e10ac20/Gentex-Selection-Process-for-New-Board-Candidates

Required Experience and Qualifications:

- Knowledge and first-hand experience working with an entrepreneurial company. •High level of personal and professional integrity.
- Successful and distinguished business management career using core Gentex principles.
- Significant understanding and experience with the global auto industry and/or electronics technology (or another industry in which the Company has interest in entering).
- Ability to work effectively with current Board members

Other Desirable Characteristics and Experience:

- Gender, race, ethnicity, and country of origin diversity.
- Growth company experience.
- Significant experience with manufacturing companies in the global OEM automotive supplier industry at senior management levels.
- Public company experience. "

http://ir.gentex.com/getattachment/099569a2-b9af-4b63-9920-ca640c145d1e/Position-Profile-of-a-Member-of-the-Board

Agree Realty (Director Qualifications in Proxy Statement)

"Our Nominating and Governance Committee has established policies for the desired attributes of the Board as a whole, including as set forth in our Corporate Governance Guidelines. The Board seeks to ensure that a majority of its members are independent within the NYSE listing standards. Further, each director generally may not serve as a member of more than six other public company boards. Each director must possess the individual qualities of integrity and accountability, informed judgment, high performance standards and must be committed to representing the long-term interests of our Company and our stockholders. In addition, directors must be committed to devoting the time and effort necessary to be responsible and productive members of the Board. The Board values diversity, in its broadest sense, reflecting, but not limited to, profession, geography, gender, ethnicity, skills and experience and endeavors to include women and minority candidates in the qualified pool from which Board candidates are chosen. The Nominating and Governance Committee conducts reviews of current

directors in light of the considerations described above and their past contributions to the Board. The Board reviews the effectiveness of its director candidate nominating policies annually"

https://www.sec.gov/Archives/edgar/data/917251/000114420416088930/v432346_def14a.htm

Neogen (Nominating Committee Charter Section)

"Identify persons qualified to become directors, and as appropriate recommend candidates to the Board for its approval. In assembling a pool of potential candidates from which to make recommendations, the Committee will endeavor to include women and minority candidates."

http://neogen.com/pdf/GovernanceCharter-6-14-2016.pdf

Please Note: These examples are the result of separate corporate engagements undertaken by the UAW Retiree Medical Benefits Trust and NorthStar Asset Management, Inc. (Boston, MA / www.northstarasset.com)

GENDER DIVERSE BOARDROOMS

JOIN OTHER INSTITUTIONAL INVESTORS

in a powerful and collaborative movement

The business case for gender diversity is now well-documented and accepted: companies with women in leadership positions are better governed and have higher performance results. In 2015, **women held only 19.9% of corporate board seats in S&P 500 companies**, while women represent close to 50% of the U.S. workforce.

The Thirty Percent Coalition is a unique and groundbreaking national organization of more than 80 members committed to the goal of women, including women of color, holding 30% of board seats across public companies.

Founded in late 2011, the Coalition includes public companies, private equity, institutional investors, professional service firms, national women's organizations, and government officials for the first time working together to drive the pace of change. The Coalition's work is on the demand side of board diversity – influencing corporations to strengthen their efforts to increase the number of women on their boards. There is no other organization of this kind in the United States.

A Committee of Institutional Investors, both Coalition and non-Coalition members, **representing over $3 trillion in assets under management**, has communicated with companies in the Russell 1000 with no women directors through letters and conversations and, in some instances, filing shareholder resolutions. A significant number of collaborative conversations with company leadership have resulted in changes to corporate governance charters and, to date, more than 100 companies contacted by the Coalition and its members have appointed a women board member for the first time.

Become a member of the Thirty Percent Coalition

Recognition of your Fund's commitment to diversity

- Showcase your commitment by recognizing Gender Diversity as an important business issue and promote your fund's image through affiliation with the Thirty Percent Coalition
- Leverage your fund's influence through participation in the Coalition's Institutional Investor Committee initiatives and partner with your peers to jointly file shareholder resolutions and engage companies in meaningful conversations to effect change;
- Contribute thought leadership through articles, blogs and other social media highlighted via the Coalition's social media initiatives

Networking/Resources

- Tap member resources: speakers for internal conferences, internal training, partners, databases for board candidates, and exchanging ideas on best practices through small group meetings and committee work
- Collaborate with Coalition members across industries at an annual Summit to share initiatives, strategies and successes
- Access to the latest academic/financial research on this critical topic

Advocacy

- Leverage your fund's voice through the Coalition's op-ed articles and commentary on policy initiatives
- Support the Coalition's work to influence a range of policymakers, corporate leaders, and industry associations

Annual Membership Contribution for Institutional Investors to support our programs: $2,000

Contact us today: Charlotte Laurent-Ottomane, Executive Director, clo@30percentcoalition.org