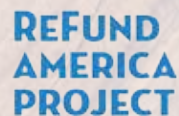
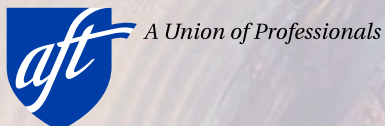


A photograph of a wooden surface with a pile of gold leaf, two brushes, and a gold egg. The gold leaf is crumpled and shiny, with some pieces scattered around. The brushes have wooden handles and silver ferrules with natural bristles. The gold egg is smooth and reflective. The wood has a dark, grainy texture with some knots and imperfections.

ALL THAT GLITTERS IS NOT GOLD

AN ANALYSIS OF US PUBLIC PENSION INVESTMENTS IN HEDGE FUNDS

ELIZABETH PARISIAN, AFT AND SAQIB BHATTI, ROOSEVELT INSTITUTE



Executive Summary

Hedge funds have aggressively pursued U.S. public pension dollars, maintaining that they offer pension funds absolute return and volatility reduction in exchange for the high management and performance fees that they charge. And many public pension systems, with encouragement from their investment consultants, have made significant allocations to hedge funds, chasing the promise of superior returns and downside protection. These pension funds now have sufficient experience to evaluate whether hedge funds have delivered on their promise, and whether the purported benefits are worth the high fees.

This report examines whether hedge funds have, in fact, provided U.S. pension funds better and less correlated returns, and whether hedge fund fees are adequately disclosed and as disproportionately high as critics suggest. In other words, we seek to answer the question: “Would public pension funds have fared better if they had never invested in hedge funds at all?”

To answer this question, we analyzed 11 U.S. public pension funds’ experience with investing pensioners’ savings in hedge funds. Using publicly available data and information provided directly by the pension funds, we conducted a simple year-by-year comparison of hedge fund net returns and total fund net returns for each pension fund. We also compared these rates of return with fixed income net returns for each pension fund to determine whether hedge funds delivered on the promise of uncorrelated returns and whether less expensive fixed income strategies do better. Because hedge fund fees are almost never reported or fully accounted for, we used industry standard fee structures like management and incentive fees, then projected actual fees captured by hedge fund managers based on readily available statements of net return to investors. These calculations, while not precise due to lack of transparency with respect to fees, allow us to draw general conclusions about the performance of pension funds’ hedge fund investments.

Key Findings: Hedge Funds Were Responsible for an Estimated \$8 Billion in Lost Investment Revenue

Our findings suggest that these 11 pension funds’ hedge fund investments failed to deliver any significant benefits to the pension funds studied. Specifically, we found that:

- Hedge fund net return rates lagged behind the total fund for nearly three-quarters of the total years reviewed, costing the group of pension funds an estimated **\$8 billion in lost investment revenue**.

Despite lagging performance, hedge fund managers collected an estimated **\$7.1 billion in fees** from the same pension funds over the period reviewed; on average, our estimates suggest that these pension funds paid 57 cents in fees to hedge fund managers for every dollar of net return to the pension fund.

- Whereas hedge fund managers promise uncorrelated returns and downside protection, all of the 11 pension funds reviewed demonstrated significant correlation between hedge fund and total fund performance.¹

Recommendations:

Considering the implications of these findings for pension fund trustees, participants and consultants, we recommend that public pension funds currently invested in hedge funds immediately take the following steps:

- **Conduct an asset allocation review to examine less costly and more effective diversification approaches.** The review should include a complete analysis of past net performance of their hedge fund investments, as well as a comparison with low-fee alternatives.
- **Require full and public fee disclosure from hedge fund managers and consultants,** including complete disclosure of historical investment management and incentive (carry or profit-sharing) fees captured by hedge fund managers for the duration of their fund's investments. Pension funds should also consider developing legislative policies requiring this level of disclosure.

¹ A previous version of this report stated that 10 out of 11 pension funds had significant correlation. This new finding reflects corrected data.

All That Glitters Is Not Gold: An Analysis of U.S. Public Pension Investments in Hedge Funds

INTRODUCTION

Over the last decade, hedge fund managers and consultants have convinced many U.S. public pension funds to invest hundreds of billions of public pension dollars in hedge funds—largely unregulated, high-cost investment vehicles that promise outsized returns and volatility protection for their investors. As of mid-2014, \$450 billion in U.S. public pension assets was invested in hedge funds,² and one-fifth of institutional investor capital invested in hedge funds came from public pension plans.³

Recently, however, hedge funds have come under scrutiny, as 2015 is on track to be a record low year for hedge fund returns, following many more years of disappointing performance. Many investors are now beginning to question the ability of hedge funds to live up to their claims—and some investors, such as the California Public Employees’ Retirement System (CalPERS), the nation’s largest public pension fund, have decided to divest from the asset type entirely.

This report examines whether hedge funds have, in fact, provided U.S. pension funds better and less correlated returns, and whether hedge fund fees are transparent and as disproportionately high as critics suggest. In other words, we seek to answer the question: **“Would public pension funds have fared better if they had never invested in hedge funds at all?”**

To answer this question, we analyzed 11 U.S. public pension funds’ experience with investing pensioners’ savings in hedge funds. Using publicly available data and information provided directly by the pension funds, we conducted a simple year-by-year comparison of hedge fund net returns and total fund net returns for each pension fund, and also compared these rates of return to fixed income net returns for each pension fund to determine whether hedge funds delivered on the promise of uncorrelated returns.

Typically, hedge fund performance is compared with public equities like the Standard & Poor’s 500. We chose a more conservative approach by comparing pension funds’ hedge fund net return with their own total fund net return. Comparing hedge funds over periods of 4 to 13 years—a period that included many positive markets as well as the 2008 financial meltdown—with a well-diversified total portfolio (i.e., with the total fund) provides a view of whether the diversification and net return benefits outweigh the high fees.

The question of measuring hedge fund fees was daunting due to several factors:

- Hedge funds simply do not disclose fees to investors, and pension consultants consistently fail to report fees to their pension clients.

² Miles Johnson, “Profits at a Price in the World of Hedge Funds,” *Financial Times*, May 26, 2015, www.ft.com/intl/cms/s/2/6252febe-b150-11e4-831b-00144feab7de.html#axzz3r70IPxrN.

³ 2015 Preqin Global Hedge Fund Report (Sample Pages), www.preqin.com/docs/samples/2015-Preqin-Global-Hedge-Fund-Report-Sample-Pages.pdf.

- Hedge fund managers may state fee structures within contracts with their investors, but they do not release actual fee data.
- We found no reliable source on hedge fund fees, including commercial hedge fund databases, consultant reports and pension fund reports.

Therefore, the only way to gather fee data was to back-analyze publicly available hedge fund net rates of return and add in incentive and management fees based on a conservative estimate of hedge fund fee structures. To arrive at these estimates, we used standard industry fee structures for management and incentive fees, and then projected actual fees captured by hedge fund managers based on readily available statements of net return and assets under management (AUM) to investors.

Our analysis suggests that, despite promises of better and less correlated returns, **hedge funds failed to deliver significant benefits to any of the pension funds we reviewed.** Instead, our findings suggest that hedge funds collected billions in disproportionately high fees that do not appear to be justified by performance, while costing public pension funds—and the public employees and taxpayers who fund them—additional billions in lost investment revenue.

Specifically, our analysis suggests that:

- Hedge fund net returns lagged behind the total fund for nearly three-quarters of the total years we reviewed, costing the group of pension funds an estimated **\$8 billion in lost investment revenue.**
- The 11 pension funds in our analysis paid an estimated **\$7.1 billion** in fees to hedge fund managers over the life of their hedge fund investments; on average, each pension fund paid an estimated **\$81 million** per year in fees to hedge fund managers.
- For every dollar of net returns to the pension fund, the average pension fund analyzed paid an estimated 57 cents in fees to hedge fund managers—compared with 5 cents in management fees per dollar of net return for a same-sized total fund portfolio.⁴
- To offset the fee difference, we estimate that hedge fund investments would have to produce approximately more than double the returns of a same-sized total fund portfolio in order to justify the higher fees.
- Whereas hedge fund managers promise uncorrelated returns and downside protection, all of the pension funds we reviewed demonstrated significant correlation between hedge funds and the total fund.⁵

Indeed, our findings suggest that **all 11 pension funds included in our analysis would have performed better having never invested in hedge funds in the first place.** This has important implications not only for pension fund trustees, who have a fiduciary duty to prudently seek investments that provide the highest long-term returns for the lowest cost to the pension fund, but also for public employees, public

⁴ A same-sized total fund portfolio refers to a portfolio reflecting the total pension fund's asset allocation distribution that is equal in dollar amount to the pension fund's hedge fund asset allocation.

⁵ A previous version of this report stated that 10 out of 11 pension funds had significant correlation. This new finding reflects corrected data.

employee unions, retirees and taxpayers, all of whom should be concerned about this overall negative impact that hedge funds are exerting on public pension funds.

HEDGE FUND FEES, RETURNS AND CORRELATION

In examining how pension funds have fared by investing in hedge funds, we considered the claims that hedge funds make related to performance, fees and correlation, and asked whether the evidence suggests that they have been able to live up to these claims. The following is a review of the major promises hedge funds make to investors—specifically, absolute return or “alpha,” justified fees, and uncorrelated returns—along with recent studies that address hedge funds’ track record of keeping these promises.

HIGHER FEES FOR LOWER RETURNS

Public pension funds rely on investment firms for various services, including investment management, consultancy and legal advice. While many of these services are important for maintaining the health of pension funds, the fees that investment management firms charge for them can be exorbitant, sometimes arbitrarily so. Different classes of investment managers have developed their own pricing structures, and they stand by them, creating the illusion of a natural market rate, while, in fact, managers charge what they believe investors will pay, and the information asymmetry is in their favor.

Hedge funds, like private equity firms, typically use a “two-and-twenty” fee structure. This means investors must pay a management fee of 2 percent, or 200 basis points, on the amount of the investment, and then a performance fee (sometimes called an incentive or profit sharing fee) of 20 percent, or 2,000 basis points, on any returns above a set target (one basis point is equal to one-hundredth of 1 percent).⁶ Even if an individual pension fund is successful in negotiating those fees down a little, they still dramatically outpace fees for every other kind of investment. On average, the overall fees that U.S. pension funds pay for their total portfolio amount to 46.8 basis points, far less than hedge fund fees.⁷

Looking at the effect of fees on individual 401(k) accounts can help shine a light on how much of an impact these fees can exert over time. According to the Department of Labor, an increase in fees for an individual participant of a 401(k) plan by 1 percent, or 100 basis points, will result in a 28 percent reduction in that person’s individual retirement savings over 35 years.⁸

Importantly, fees charged by hedge funds are not limited to management and performance fees. Hedge funds routinely charge a range of additional fees—to cover administrative, legal or transaction costs, for example—back to the pension fund without clearly disclosing the amount of these fees. In fact, pension funds and other investors are often contractually prohibited from obtaining information about these

⁶ “Two and Twenty,” *Investopedia*, www.investopedia.com/terms/t/two_and_twenty.asp.

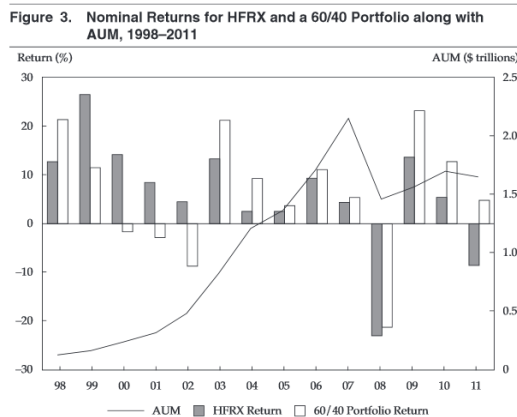
⁷ See: Amanda White, “Do Pension Funds Add Value?” *Top 1000 Funds*, Jan. 14, 2015, www.top1000funds.com/news/2015/01/14/do-pension-funds-add-value/.

⁸ “A Look at 401(k) Plan Fees,” U.S. Department of Labor, www.dol.gov/ebsa/publications/401k_employee.html.

“hidden fees” in the first place. In other words, some hedge funds require pension funds to sign contracts stating that hedge funds do not have to disclose these fees, and that pension funds do not have the right to require disclosure.

Hedge fund managers justify the fees they charge to investors by claiming that they provide outsized returns that offset the fees, and that they help diversify investor portfolios because hedge fund returns are uncorrelated with equity markets, providing a more favorable risk-return ratio. In effect, hedge fund managers suggest that when these factors are considered, the higher hedge fund fees pay for themselves.

However, a 2012 analysis by Simon Lack, the author of *The Hedge Fund Mirage* who once ran J.P. Morgan’s hedge fund seeding operation, suggests that these claims are simply untrue. Lack’s study compared the internal rate of return on the Hedge Fund Return Index (HFRX) and a benchmark 60/40 stock/bond portfolio between 1998 and 2011. Lack found that the benchmark portfolio outperformed the HFRX every single year after 2002.⁹ That means that, not only would a pension fund that had invested in hedge funds have achieved lower returns than if it had just invested in the stock and bond markets, but also it would have compounded its losses by paying astronomical fees to the hedge fund managers.



SOURCE: Simon Lack, “The Hedge Fund Mirage” (CFA Institute Conference Proceedings, December 2012).

FALLING WITHOUT A PARACHUTE

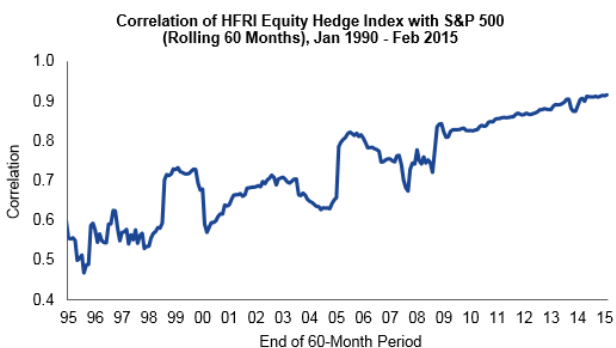
In addition to outsized returns, hedge fund managers also claim to provide consistent returns that help investors smooth out the effects of market volatility. They suggest that their unique investment strategies allow them to prosper regardless of market conditions, and they claim that even though they

⁹ Simon Lack, “The Hedge Fund Mirage: The Illusion of Big Money and Why It’s Too Good to Be True,” CFA Institute, December 2012, www.cfapubs.org/doi/pdf/10.2469/cp.v29.n4.4, pages 14-23.

may underperform the market during good years (while providing positive returns), they make up for that in bad years by continuing to provide consistently positive returns.¹⁰

However, research suggests otherwise. Market data shows that hedge funds, on average, are highly correlated with the stock, or equities, market. Not only does this correlation limit their ability to provide consistent returns regardless of market conditions, it also constrains their ability to produce returns in excess of the market average—calling into question hedge funds’ principal claims.

Several studies and analyses show that hedge fund returns have grown more and more correlated with equities over time. The most striking is Morgan Stanley’s 2015 “U.S. Equity Strategy” report, which has been tracking the correlation for several years. As the chart below shows, the Hedge Fund Research Inc. (HFRI) Equity Hedge Index has become increasingly correlated with the S&P 500, especially since the 2008 financial crisis.



Morgan Stanley Research, “U.S. Equity Strategy” (April 7, 2015).

This is a view that has also been advanced by other analysts, with researchers from the hedge fund AQR finding a 93 percent correlation between another hedge fund index, the HFRI Fund Weighted, and equities.¹¹ A recent analysis of 10 HFRI indices shows that, while correlation with S&P 500 has varied over time, hedge funds still have “greater correlations with passive asset classes than previously thought,”¹² with “passive asset classes” representing portfolios that are based entirely on indices that track the broader market.

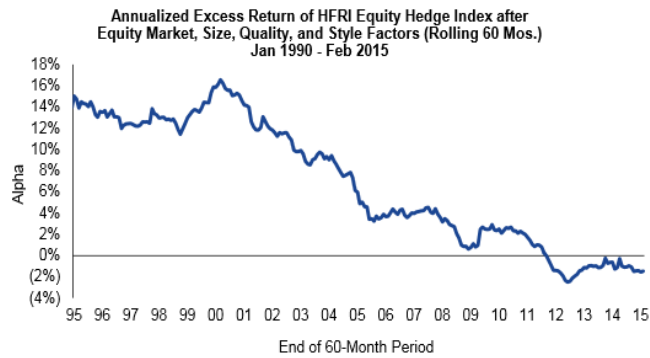
As might be expected, as hedge fund returns grow more correlated with the broader market, the ability of the average hedge fund to generate excess returns, or alpha, has decreased. The graph below from Morgan Stanley shows that, not only have hedge funds’ ability to generate alpha been on a downward trajectory since 2000, but since 2011 hedge funds have actually resulted in excess losses.¹³

¹⁰ This argument seemingly undercuts their claim to always beat the market, but we will not examine that inconsistency in this report.

¹¹ Steve Johnson, “Hedge Fund Correlation Risk Alarms Investors,” *Financial Times*, June 29, 2014, www.ft.com/intl/cms/s/0/b5ad4370-fde7-11e3-acf8-00144feab7de.html#axzz3nujXn4l.

¹² “Are Hedge Funds Uncorrelated with Financial Markets? An Empirical Assessment,” IPAG Business School working paper 2014-103, www.ipag.fr/wp-content/uploads/recherche/WP/IPAG_WP_2014_103.pdf.

¹³ Morgan Stanley Research, “U.S. Equity Strategy” (April 7, 2015), alfaalliance.info/wp-content/uploads/2015/04/Morgan-Stanley-on-US-strategy.pdf, 22.



Morgan Stanley Research, “U.S. Equity Strategy” (April 7, 2015).

A corollary of the uncorrelated returns theory is hedge fund managers’ claim that they can help protect investor capital from market downturns, with the supposed excess returns offering a buffer against turbulent markets. The reality is that hedge funds have failed spectacularly at protecting investor capital during bear markets, and this failure can be attributed to risks that are unique to hedge funds. This became most apparent in light of the 2008 financial crash, when the average hedge fund posted 19 percent in losses.¹⁴ Hedge fund investments failed to protect investor capital, and, as a result, investors lost an estimated \$450 billion that year.¹⁵ As the *New Yorker* noted, “That was considerably more than all the profits that the industry had generated in its entire history.”¹⁶

Academics and observers have pointed out that this was not an anomaly and that hedge funds’ inability to weather financial crises may be an innate feature of hedge funds themselves. An influential 2009 paper examined eight hedge fund strategy indices during periods of financial upheaval, and found that, across multiple strategies, hedge fund volatilities nearly double during financial crises.¹⁷ Perhaps more alarming, nearly 40 percent of that volatility is attributable specifically to hedge funds, and not explained by market or systemic factors.¹⁸

Simon Lack attributes some of the clumsiness that hedge funds experience during market downturns to their legal structure. Hedge funds tend to aggregate individual investments into one large investment vehicle called a limited partnership. Because the investments are all pooled together, should an investor decide to pull out during a turbulent time, the value of the entire limited partnership will decline. These losses can cause other investors to withdraw their money as well, which can have a spiraling effect, causing managers to sell off assets at fire sale prices, forcing further losses and generating further

¹⁴ Jenny Strasburg and Scott Patterson, “A Hedge-Fund King Comes under Siege,” *Wall Street Journal*, Nov. 20, 2009, www.wsj.com/articles/SB125859118417754637.

¹⁵ John Cassidy, “How Do Hedge Funds Get Away With It? Eight Theories,” *New Yorker*, May 14, 2014, www.newyorker.com/rational-irrationality/how-do-hedge-funds-get-away-with-it-eight-theories.

¹⁶ Cassidy, “How Do Hedge Funds Get Away With It?”

¹⁷ Billio, Getmansky, and Pelizzon, “Crises and Hedge Fund Risk,” 1.

¹⁸ The authors suggest many reasons why hedge funds suffer these idiosyncratic risks, including increased redemptions and counterparty risks periods of volatility. Billio, Getmansky, and Pelizzon, “Crises and Hedge Fund Risk,” 1.

redemptions.¹⁹ Furthermore, because hedge funds have safeguards built into prevent capital outflows during down markets, this can actually incentivize investors to pull out prematurely at the first sign of trouble to avoid getting stuck in a bad investment.

2015: AN IMPORTANT TEST FOR HEDGE FUNDS

August 2015 served as a significant reminder to investors of just how volatile hedge funds can get when a crisis erupts. While some hedge funds did outperform the S&P 500 in the month of August, the *New York Times* reported in September that hedge fund returns had trailed the broader market over the previous year:

Over the last year, including August, hedge funds lagged far behind, losing on average about 3.5 percent compared with a decline of about 1.6 percent in the S&P 500 and a gain of roughly 1 percent in the 60/40 benchmark index. Longer term, hedge funds have underperformed benchmarks over five- and 10-year periods.²⁰

Some observers were more blunt about the August hedge fund losses. Troy Gayeski, a portfolio manager at SkyBridge Capital, noted, “There is a lot of chaos and carnage out there” for emerging market managers.²¹ The *Telegraph* reported,²² “August was the cruelest month for hedge funds, which suffered their steepest losses since the financial crisis.”

These declines have continued into September, with major players in the hedge fund market losing money. Greenlight Capital lost 3.6 percent in September, which left it with a 17 percent loss year-to-date.²³ Bill Ackman’s Pershing Square Capital Management was down 12.5 percent in September and down 12.6 percent year-to-date.²⁴ Glenview Capital Management was down 12.4 percent in September and off 12.8 percent year-to-date.²⁵ Third Point, managed by activist investor Daniel Loeb, was down 4.8 percent in September and was negative 7.5 percent year-to-date.²⁶ Jana Partners was down 3.8 percent in September and down 6.6 percent year-to-date.²⁷

¹⁹ Simon Lack, “2008—The Year Hedge Funds Broke Their Promise to Investors,” in *The Hedge Fund Mirage: The Illusion of Big Money and Why It’s Too Good to be True* (Hoboken, NJ: John Wiley & Sons, 2012), 85-86.

²⁰ James B. Stewart, “Hedge Funds Faced a Test in August, and Faltered,” *New York Times*, Sept. 3, 2015, www.nytimes.com/2015/09/04/business/dealbook/a-choppy-august-tested-hedge-funds-and-many-stumbled.html?_r=1.

²¹ Madison Marriage, “‘Chaos and Carnage’ Threaten Emerging Market-Focused Hedge Funds,” *Financial Times*, Sept. 6, 2015, www.ft.com/intl/cms/s/0/308566c4-5245-11e5-b029-b9d50a74fd14.html#axzz3nXc5cp4i.

²² Marion Dakers, “Hedge Funds Suffer Biggest Losses Since the Financial Crisis,” *Telegraph*, Oct. 7, 2015, www.telegraph.co.uk/finance/newsbysector/banksandfinance/11917515/Hedge-funds-suffer-biggest-losses-since-the-financial-crisis.html.

²³ Svea Herbst-Bayliss, “Hedge Fund Moguls Einhorn, Loeb, Rosenstein Lose Money in September,” *Reuters*, Sept. 30, 2015, www.reuters.com/article/2015/10/01/us-hedgefunds-einhorn-idUSKCN0RU30420151001#KKvQMmV8Ku06yKiL99.

²⁴ Nathan Vardi, “Billionaire Bill Ackman’s Pershing Square Hedge Fund Is Down 19% in 2015,” *Forbes*, www.forbes.com/sites/nathanvardi/2015/10/01/billionaire-bill-ackmans-hedge-fund-plunges-12-5-in-september/.

²⁵ Svea Herbst-Bayliss, “RPT-U.S. Hedge Funds Brace for Worst Year since Financial Crisis,” *Reuters*, Oct. 4, 2015, www.reuters.com/article/2015/10/04/hedgefunds-returns-idUSL1N1222TK20151004.

²⁶ Herbst-Bayliss, “Hedge Fund Moguls.”

²⁷ Herbst-Bayliss, “Hedge Fund Moguls.”

ARE HEDGE FUNDS WORTH THE COST TO PENSION FUNDS?

As the studies outlined above suggest, hedge funds deserve to face intense and frequent scrutiny about the investment benefits they deliver to pension funds and other investors. The remainder of this report outlines our own analysis as we examined the impact of hedge funds on pension funds with respect to returns, fees and volatility protection.

DATA AND METHODOLOGY

We analyzed a set of 11 public pension funds, with a total of approximately \$638 billion in assets under management (AUM), and \$43 billion in hedge fund AUM as of the most recent fiscal year reported. The pension funds included in this analysis are:

- Employees' Retirement System of Rhode Island (ERSRI)
- Illinois State Board of Investment (ISBI)
- Maryland State Retirement and Pension System (SRPS)
- Massachusetts Pension Reserves Investment Management Board (PRIM)
- New Jersey Pension Fund
- New York City Employee Retirement System (NYCERS)
- New York State Common Retirement Fund (NY Common)
- Ohio Public Employees Retirement System (OPERS)
- School Employees Retirement System of Ohio (SERS Ohio)
- Teacher Retirement System of Texas (TRST)
- West Virginia Investment Management Board

These funds were selected for inclusion in this report based on a combination of size of AUM, amount and duration of hedge fund investment, and availability of net return data for hedge fund investments. For the purposes of this study, we sought large public pension funds that are currently invested in hedge funds, have been invested in hedge funds for at least four years, and either make hedge fund net return data publicly available or provided this information in response to a public records request.

The average pension fund in this group had \$58 billion in total fund AUM and \$3.9 billion in hedge fund AUM for the most recent fiscal year reported. The median pension fund has reported hedge fund allocations for 9 years; the average is 8 years.

We obtained AUM and net return data for each pension fund's hedge fund and total fund investments from the following sources: comprehensive annual financial reports (CAFRs) for the pension funds, investment reports, websites and/or public records requests. For each pension fund, we used fiscal year end data reflecting the previous 12-month period.

Methodology

Hedge funds represent a complex set of investment strategies that can be characterized by the attempt to outperform the market by using unique approaches to finding market inefficiencies. Hedge funds generally compare themselves to standard market indices like the S&P 500 and suggest they will outperform that index when markets go down; in other words, they provide “downside protection” or reduce total fund volatility and risk. However, over the period 2005 to 2015, which includes the Great Recession (the largest economic crisis in 75 years), the S&P 500 index significantly outperformed hedge funds.

Therefore, a better measure of whether hedge funds add value to a large pension investor is to compare hedge fund net return with total fund net return. A comparison, over time, against an otherwise well-diversified portfolio would provide a more conservative and more appropriate measure of the value of hedge funds. For this reason, we compare hedge fund net returns with total pension fund net returns using a same-size portfolio over the life of the pension investor’s hedge fund program.

Hedge funds and consultants typically fail to disclose all information related to the fees charged to pension funds. When they do disclose these fees, the figures are often unreliable, either because they fail to account for all fees (management, performance, pass-through and otherwise), or because the terms of the investment contracts preclude pension funds from having the right to know about these fees in the first place. Commercial datasets, such as Preqin, similarly do not disclose reliable and consistent fee data.

Likewise, complexity in hedge fund fee structure proves to be a significant obstacle to obtaining hedge fund fee data from pension funds. We do not have access to information regarding hurdle rates and frequency of fee collection, for example, and there is no infrastructure in place to capture that data. As a result, it is impossible to produce a precise, detailed and accurate analysis of fees.

For these reasons, this analysis uses the following methodology to estimate costs:²⁸

1. Gross hedge fund returns are calculated using the following assumptions:
 - Hedge fund management fees are calculated conservatively at 1.8 percent of assets under management (AUM).
 - Hedge fund incentive fees are calculated conservatively at 18 percent of gross return less management fees.
2. In cases where the pension fund’s investment in hedge fund of funds represented 25 percent or more of its total hedge fund portfolio according to the most recent Preqin records, we included a modest increase in management (0.2 percent), and incentive (2 percent) fees to account for added fees above and beyond underlying hedge fund fees associated with hedge fund of funds.

²⁸ For more detailed information on sources consulted and how we applied our methodology to each specific pension fund included in our analysis, see appendix.

3. Total fund cost is estimated conservatively at 40 basis points (bp) of AUM. The average total fund cost for U.S. pension funds including hedge fund fees is 46.8 basis points;²⁹ for U.S. state pension funds, the figure is 41bp.³⁰ Assuming no hedge fund fees, 40 basis points is used.
4. Performance fees were adjusted for fiscal years where high water marks needed to be met (i.e. fiscal years following a fiscal year of negative hedge fund net returns). High water marks were accounted for based on the entire hedge fund portfolio because individual fund high water marks are not public.

The above calculations are intended as an informed estimate. Because only pension funds and their consultants have access to the actual terms of their investments it is incumbent upon them to use contract terms that define management and incentive fees, high water marks and hurdle rates (if any) to calculate total fees captured by their managers.

FINDINGS

Overall, our findings suggest that **hedge funds failed to provide the 11 pension funds we reviewed with superior and uncorrelated returns as promised. At the same time, hedge funds collected fees that are in no way justified by performance.**

HIGH FEES FOR LAGGING RETURNS

With respect to hedge fund fees and returns, our estimates suggest that, on average, the 11 pension funds we reviewed paid 7.7 times more in fees to managers for their hedge fund investments than for a same-sized total fund portfolio. Moreover, poor performance by hedge funds cost the average pension fund in our analysis an estimated \$91 million per year in lost investment revenue, suggesting that hedge funds served as an immense drag on total fund performance over time.

Additional findings include the following:

- Hedge fund net returns lagged behind the total fund for nearly three-quarters of the total years we reviewed, costing the group of pension funds **\$8 billion in lost investment revenue.**
- The 11 pension funds paid a total of **\$7.1 billion** in fees to hedge fund managers over the life of their hedge fund investments; on average, each pension fund paid **\$81 million** per year in hedge fund fees.
- On average, pension funds paid an estimated 57 cents in fees to hedge fund managers for every dollar of net return to pension fund assets—compared with 5 cents in management fees per dollar of net return for a same-sized total fund portfolio.³¹

²⁹ See White, “Do Pension Funds Add Value?”

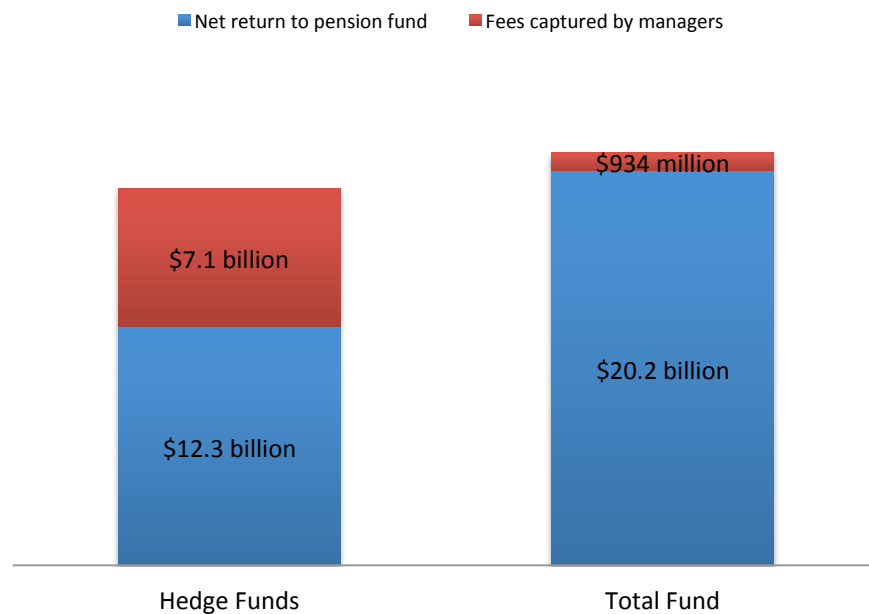
³⁰ Mike Maciag, “By the Numbers: Are State Pension Funds Paying Wall Street Too Much?” *Governing*, Aug. 15, 2012, www.governing.com/blogs/by-the-numbers/gov-state-pension-funds-pay-wall-street-investment-fees.html

³¹ A same-sized total fund portfolio refers to a portfolio reflecting the total pension fund’s asset allocation distribution, which is equal in dollar amount to the pension fund’s hedge fund asset allocation.

- On average, the pension funds we analyzed paid 7.7 times more to manage their hedge fund investments than they did for a same-sized total fund portfolio.

The following chart compares how much hedge fund managers collected in fees with management fees for a same-sized total fund portfolio for the 11 pension funds we reviewed.³² Representing 88 fiscal years worth of data between the years of 2002 and 2015, this chart shows that, not only did these pension funds’ hedge fund investments produce lower gross returns in the aggregate than a same-sized total fund portfolio, but also, once fees were taken into account, hedge fund net returns were only about 60 percent of total fund net returns, despite charging approximately 7.7 times more in fees.

11 U.S. Public Pension Funds: Hedge Fund Fees and Net Returns vs. Same-Sized Total Fund Portfolio (88 fiscal years total)



This pattern of high fees and low returns compared with a same-sized total fund is consistent across each individual pension fund we analyzed; for details on each specific pension fund, see our fund-by-fund analysis beginning on page 19.

CORRELATION: HEDGE FUND NET RETURNS VS. TOTAL FUND NET RETURNS

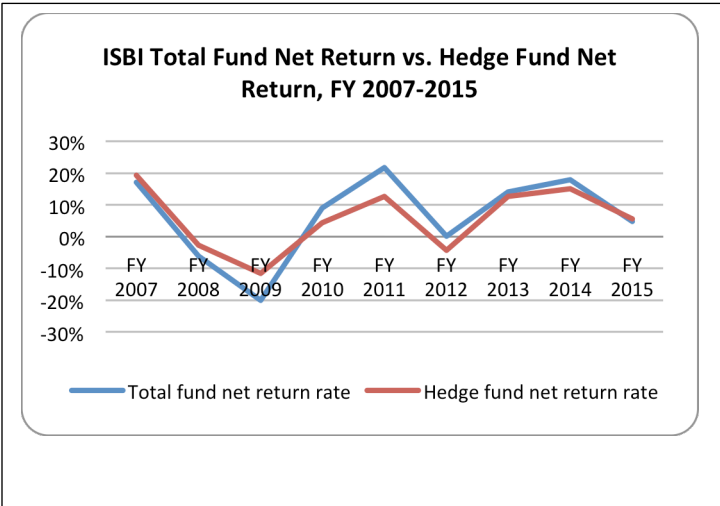
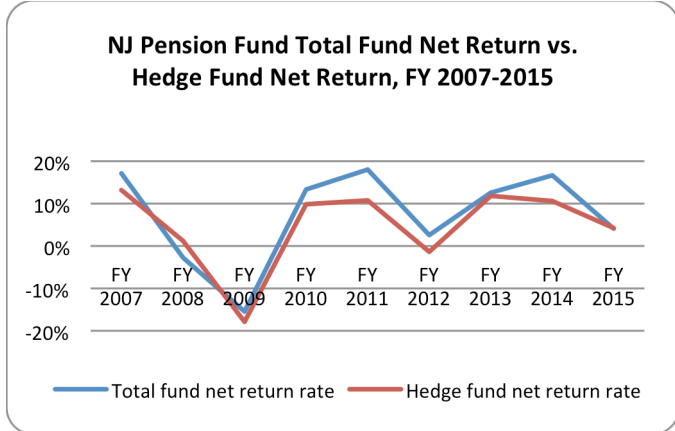
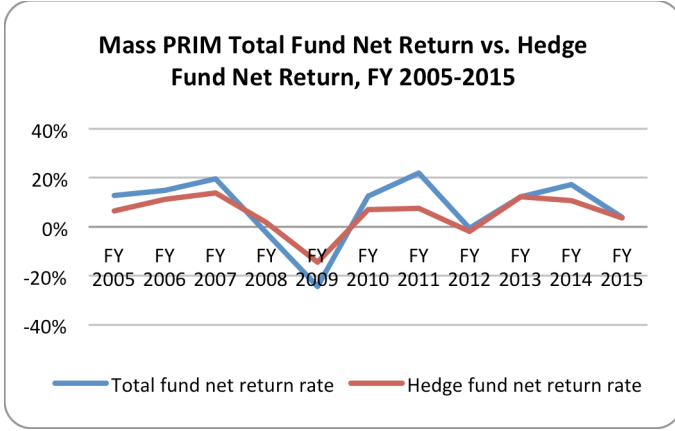
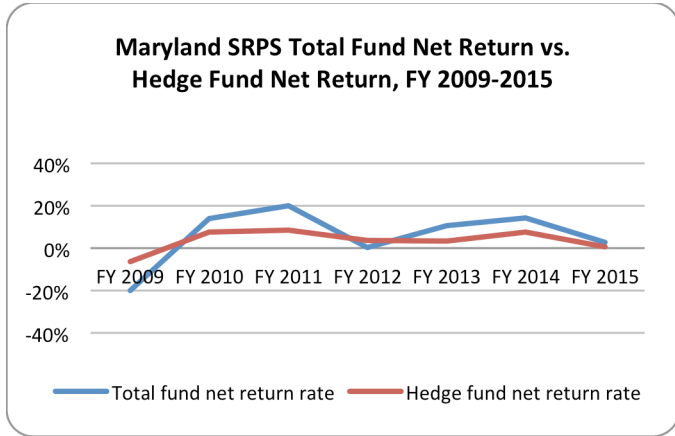
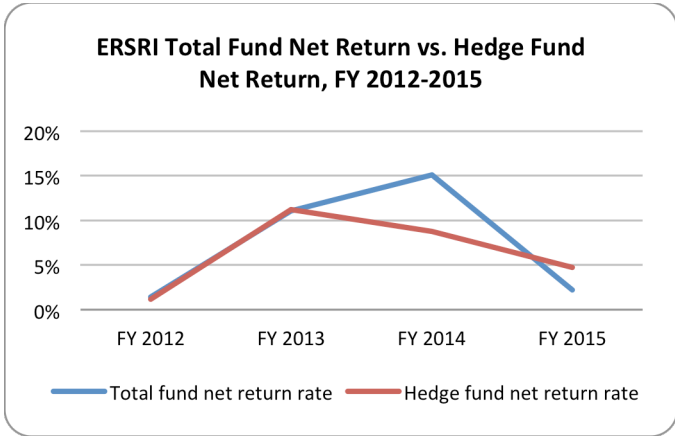
In our analysis of 11 U.S. pension funds, we put the hypothesis that hedge funds produce uncorrelated returns to the test. We found that in all 11 cases, net returns on the pension funds’ hedge fund portfolios were significantly correlated with the pension funds’ total fund net returns.³³ Specifically, we

³² “Fees captured by managers” includes internal investment staff, consultants and other investments costs.

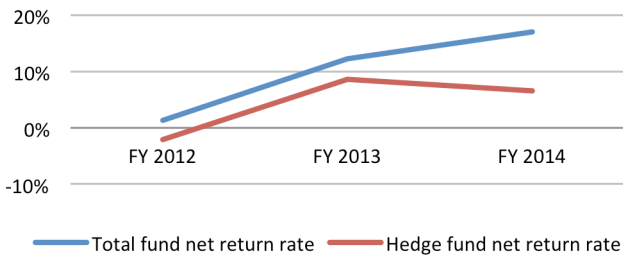
³³ A previous version of this report stated that 10 out of 11 pension funds had significant correlation. This new finding reflects corrected data.

noted that the hedge fund performance of these 11 pension funds generally tracked their total funds even during the 2008 financial crisis, the one significant economic downturn included in our study.

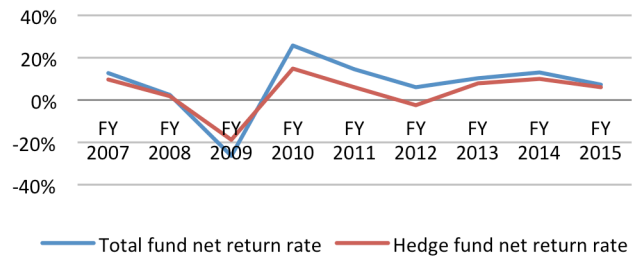
The following graphs below compare hedge fund net returns with total fund net returns for the 11 pension funds where we found significant correlation:



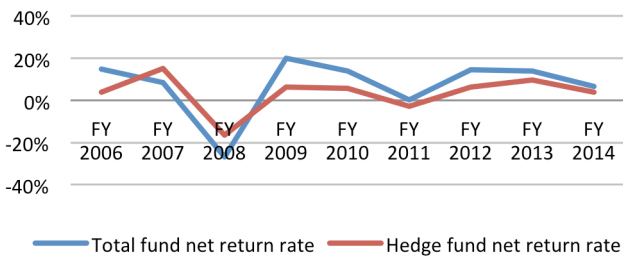
NYCERS Total Fund Net Return vs. Hedge Fund Net Return, FY 2012-2014



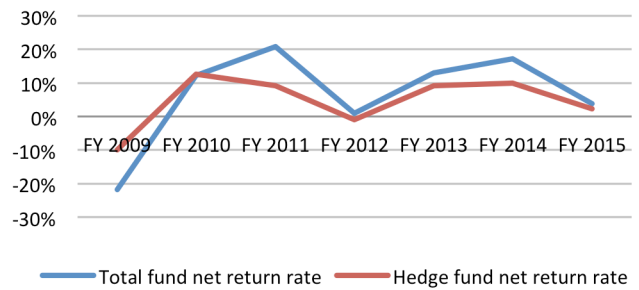
New York Common Total Fund Net Return vs. Hedge Fund Net Return, FY 2007-2015



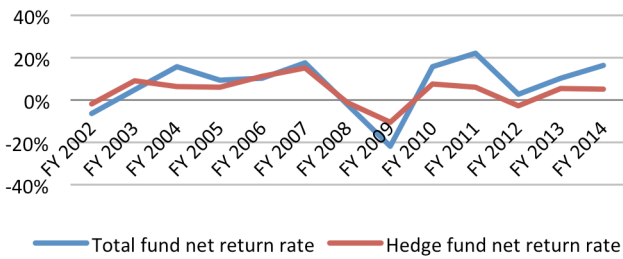
OPERS Total Fund Net Return vs. Hedge Fund Net Return, FY 2006-2014



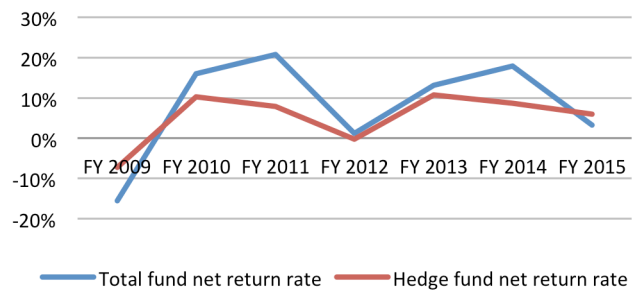
SERS Ohio Total Fund Net Return vs. Hedge Fund Net Return, FY 2009-2015



Teacher Retirement System of Texas Total Fund Net Return vs. Hedge Fund Net Return, FY 2002-2014



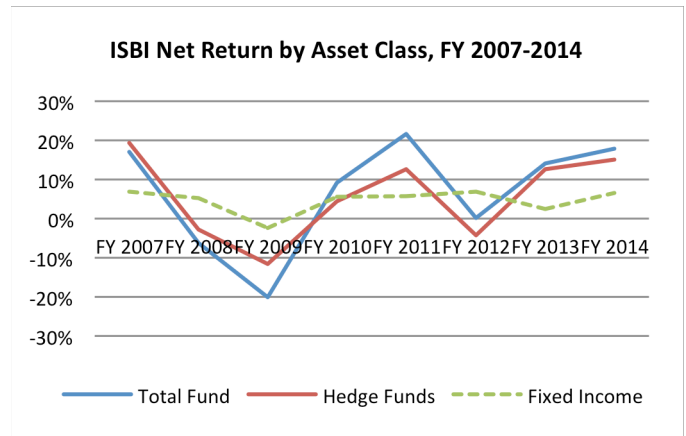
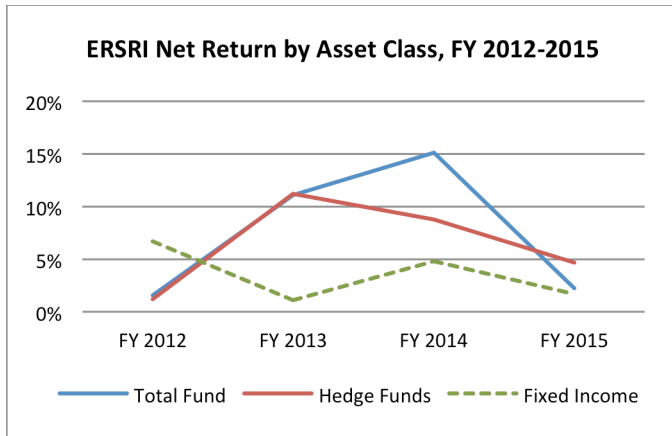
WVIMB Total Fund Net Return vs. Hedge Fund Net Return, FY 2009-2015



Note: a previous version of this report stated that ISBI did not show significant correlation between hedge fund returns and total fund returns; this version reflect corrected data.

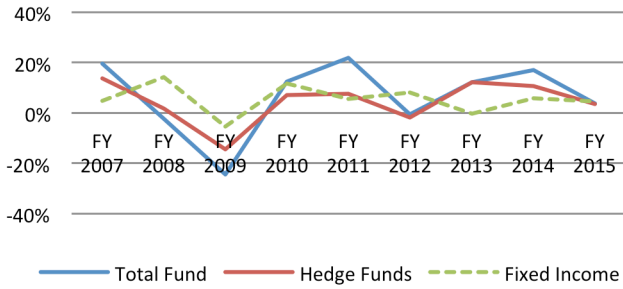
FIXED INCOME: UNCORRELATED RETURNS FOR A FRACTION OF THE COST

We were also able to obtain data on the fixed income portfolios for 9 of the 11 pension funds we reviewed; interestingly, we found that pension funds' fixed income portfolios were less correlated with the total fund than their hedge fund portfolios. This suggests that pension funds that bought into hedge funds in order to diversify their investments or buffer against losses during downturns may have been better off just investing more in fixed income at a fraction of the fees. The graphs below depict these returns across different types of asset classes at these nine pension funds:³⁴

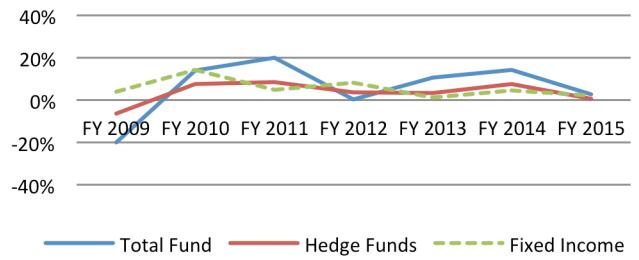


³⁴ For Massachusetts PRIM, 2005 and 2006 fixed income returns were not available; for NJ Pension Fund, 2007 fixed income returns were not available.

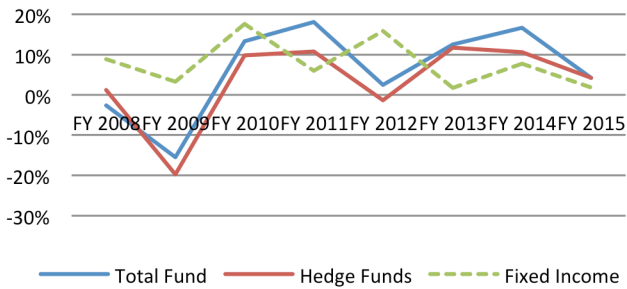
Massachusetts PRIM Net Return by Asset Class, FY 2007-2015



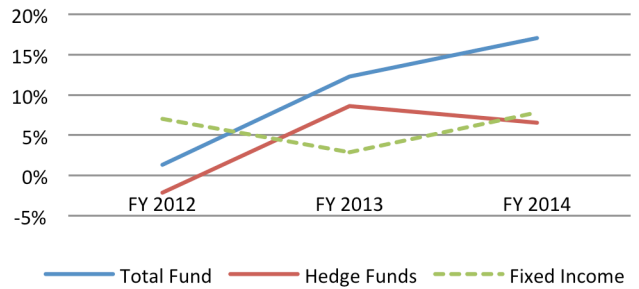
Maryland SRPS Net Return by Asset Class, FY 2009-2015



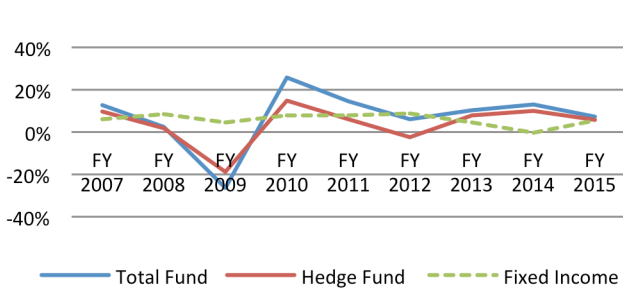
NJ Pension Fund Net Return by Asset Class, FY 2008-2015



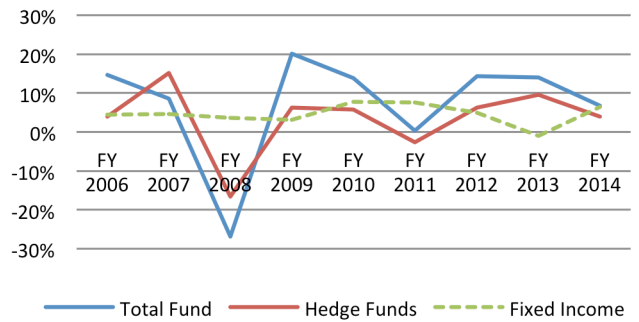
NYCERS Net Return by Asset Class, FY 2012-2014

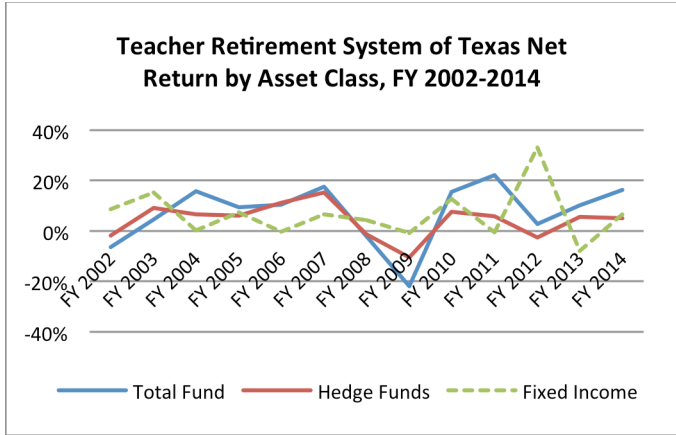


NY Common Net Return by Asset Class, FY 2007-2015



OPERS Net Return by Asset Class, FY 2006-2014





The promise of uncorrelated returns is a major selling point of the hedge fund asset class. However, our findings suggest that, for the pension funds for which we were able to obtain fixed income return data, the fixed income asset class provided less correlated returns to the pension fund than did hedge funds—at a small percentage of the cost.

THE IMPACT OF HEDGE FUNDS ON PENSION FUNDS: A FUND-BY-FUND ANALYSIS

The following pages contain detailed findings about fees and net returns for each individual pension fund in our analysis.

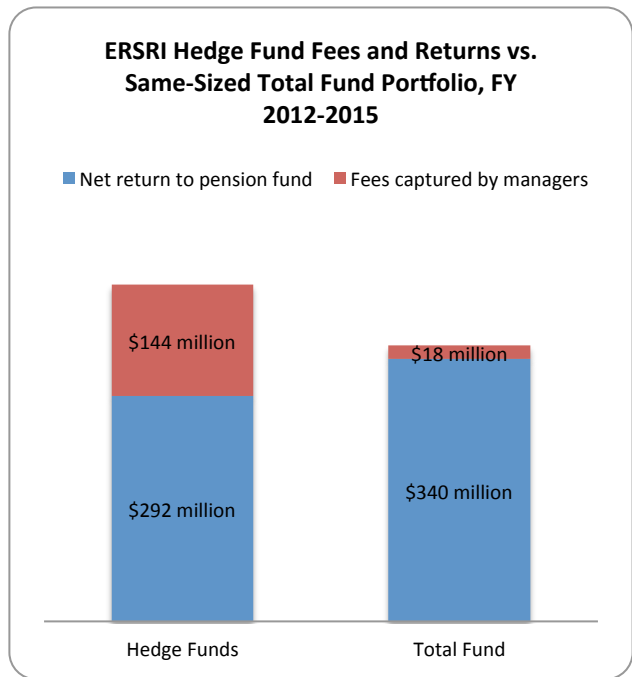
Employees' Retirement System of Rhode Island

The Employees' Retirement System of Rhode Island (ERSRI) made significant investments in hedge funds beginning in fiscal year 2012, likely on the advice of hedge funds and consultants that hedge funds would provide absolute return and downside protection to help the fund recover from losses suffered during the 2008 financial crisis. Over the last four fiscal years, hedge funds represented about 14 percent of ERSRI's total portfolio. Our analysis suggests that underperformance by ERSRI's hedge fund investments cost the pension fund an estimated \$48 million in lost investment revenue over just four years, giving ERSRI good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

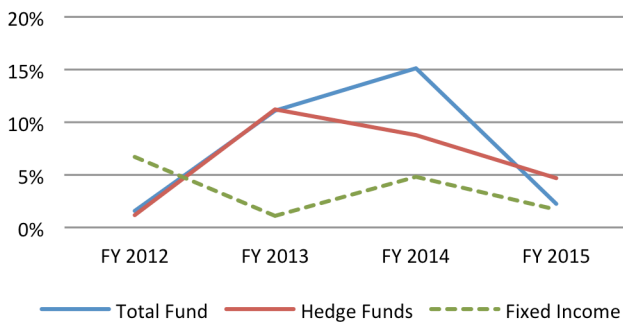
Net Returns. Over the four fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly. We estimate that a \$100 investment in hedge funds in 2012 would have grown to \$128 by the end of 2015, compared with \$133 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2012-2015, ERSRI paid \$144 million in fees to manage its hedge fund investment—compared with only \$18 million to manage a same-sized total fund portfolio. When compared with net returns, ERSRI paid 49 cents for every dollar of return to the pension fund, versus 5 cents for every dollar of net return for the total fund portfolio.

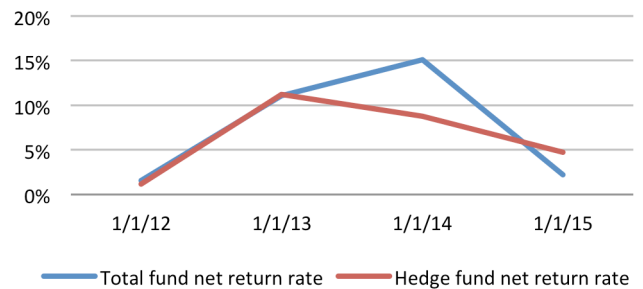
Fee Disclosure. Reports suggest that hedge fund managers and consultants fail to clearly disclose all fees charged to pension systems. This makes it difficult for pension fund trustees to assess whether ERSRI's hedge fund program is producing value relative to total cost for the pension fund.



ERSRI Net Return by Asset Class, FY 2012-2015



ERSRI Total Fund Net Return vs. Hedge Fund Net Return, FY 2012-2015



Given the underperformance of ERSRI's hedge fund investments over the last four fiscal years, Rhode Island elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

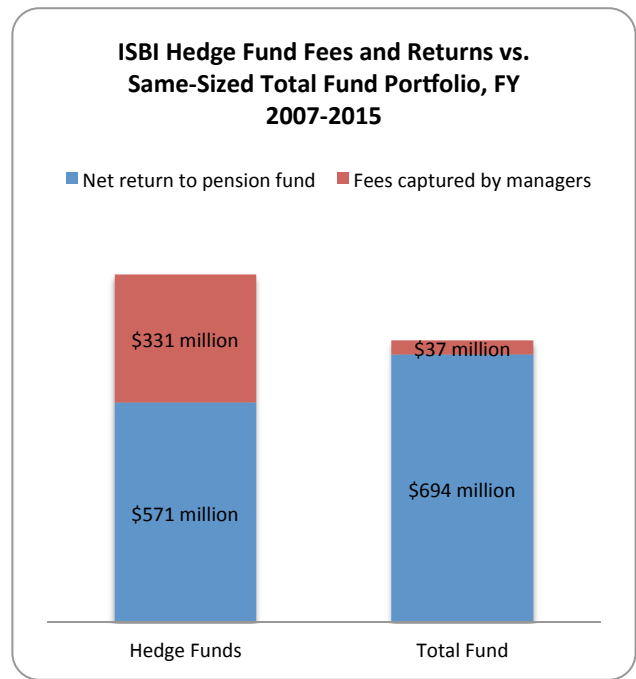
Illinois State Board of Investment

The Illinois State Board of Investment (ISBI) made significant investments in hedge funds beginning in fiscal year 2007, likely on the advice of hedge fund managers and consultants that hedge funds would produce absolute return and downside protection for the pension fund. Hedge fund allocations have nearly tripled since then, from approximately 3.88 percent in 2007 to approximately 9.95 percent at the end of June 30, 2015. Our analysis suggests that underperformance by ISBI's hedge fund investments cost the pension fund an estimated \$123 million in lost investment revenue over this period, giving ISBI good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

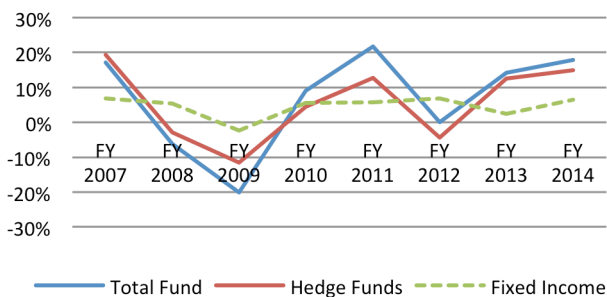
Net Returns. Over the nine fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly. We estimate that a \$100 investment in hedge funds at the beginning of FY 2007 would have grown to \$158 by the end of FY 2015, compared with \$164 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2007-2015, ISBI paid an estimated \$331 million in fees to manage its hedge fund investment—compared with only \$37 million to manage a same-sized total fund portfolio. Moreover, 100 percent of ISBI's hedge fund allocation appears to be in hedge fund of funds, which adds another layer of fees that the pension fund must pay. When compared with net returns, ISBI paid an estimated 58 cents for every dollar of return to the pension fund, versus 5 cents for every dollar of net return for the total fund portfolio.

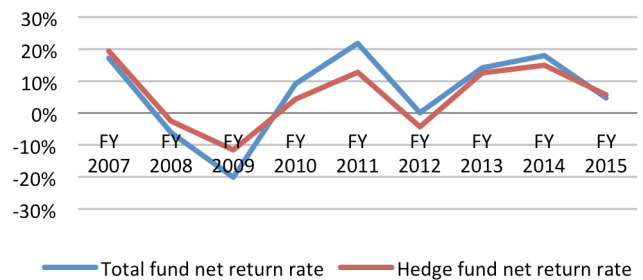
Fee Disclosure. Reports suggest that hedge fund managers refuse to disclose all fees charged to pension systems. Especially considering ISBI's heavy use of hedge fund of funds, there are likely additional fees of which trustees are unaware due to hedge fund managers and consultants failing to report these clearly to the pension fund. This makes it difficult for pension fund trustees to assess whether ISBI's hedge fund program is producing value relative to total cost for the pension fund.



ISBI Net Return by Asset Class, FY 2007-2014



ISBI Total Fund Net Return vs. Hedge Fund Net Return, FY 2007-2015



Given the underperformance of ISBI's hedge fund investments over the last nine fiscal years, Illinois elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

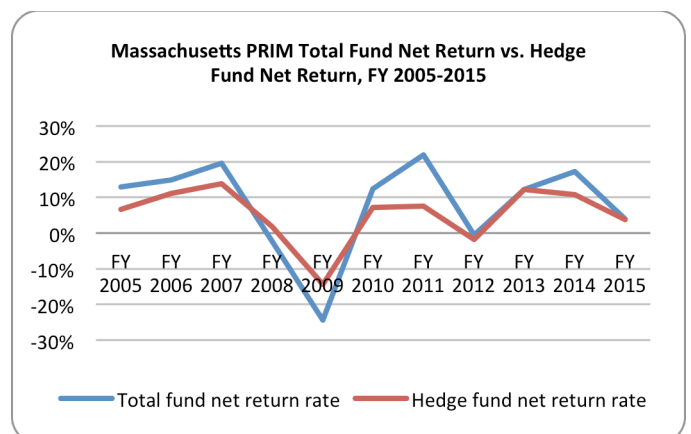
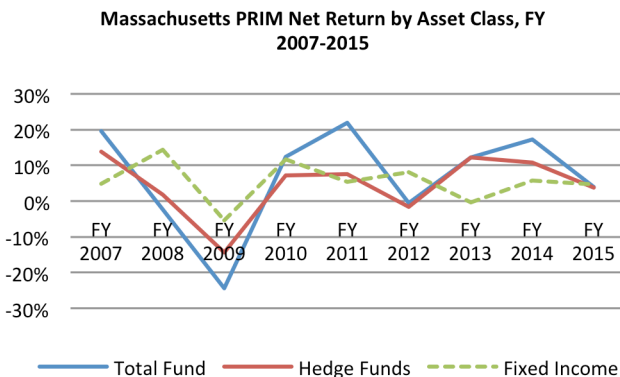
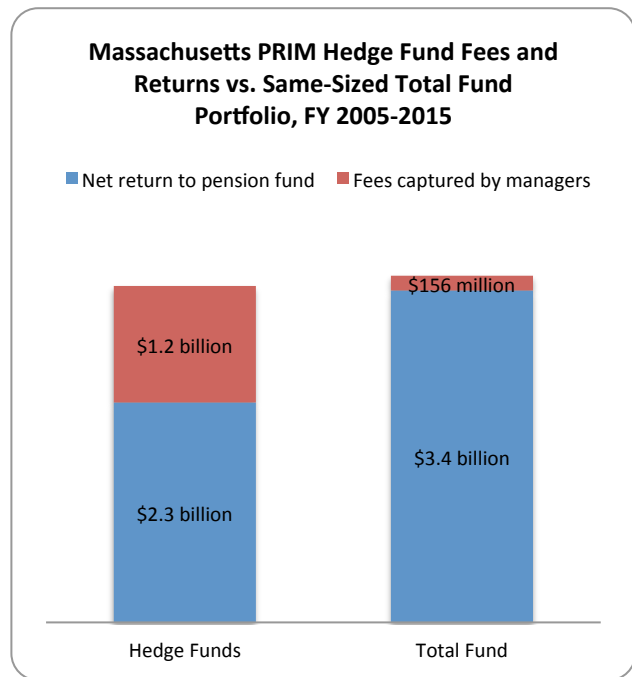
Massachusetts Pension Reserves Investment Management Board

The Massachusetts Pension Reserves Investment Management Board (PRIM) made significant investments in hedge funds beginning in fiscal year 2005 (the earliest year reported), likely on the advice of hedge fund managers and consultants that hedge funds would produce absolute return and downside protection for the pension fund. Hedge fund allocations have nearly doubled since then, from about 4.8 percent in 2005 to about 9.11 percent at the end of June 30, 2015. Our analysis suggests that underperformance by PRIM's hedge fund investments cost the pension fund an estimated \$1.2 billion in lost investment revenue over this period, giving PRIM good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

Net Returns. Over the 11 fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly. We estimate that a \$100 investment in hedge funds at the beginning of FY 2005 would have grown to \$171 by the end of FY 2015, compared with \$213 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2005-2015, PRIM paid an estimated \$1.2 billion in fees to manage its hedge fund investment—compared with only \$156 million to manage a same-sized total fund portfolio. When compared with net returns, PRIM paid an estimated 53 cents for every dollar of return to the pension fund, versus 5 cents for every dollar of net return for the total fund portfolio.

Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which PRIM trustees are unaware. This makes it difficult for pension fund trustees to assess whether PRIM's hedge fund program is producing value relative to total cost for the pension fund.



Given the underperformance of PRIM's hedge fund investments over the last 11 fiscal years, Massachusetts elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

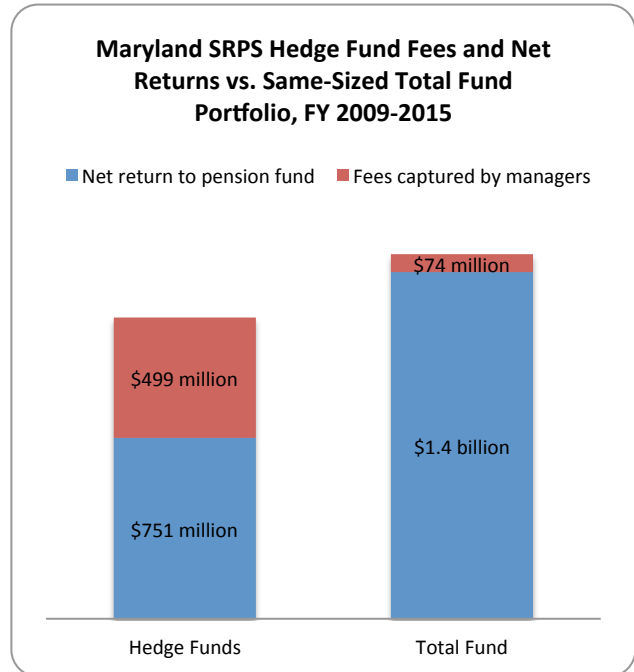
Maryland State Retirement and Pension Reserves System

The Maryland State Retirement and Pension Reserves System (SRPS) made significant investments in hedge funds beginning in fiscal year 2010 (the earliest year reported), likely on the advice of hedge fund managers and consultants that hedge funds would provide absolute return and downside protection to help the fund recover from losses suffered during the 2008 financial crisis. Hedge fund allocations have more than quadrupled since then, from approximately 2.6 percent in 2009 to 10.65 percent at the end of June 30, 2015. Our analysis suggests that underperformance by Maryland SRPS's hedge fund investments cost the pension fund an estimated \$688 million in lost investment revenue over this period, giving the pension fund good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

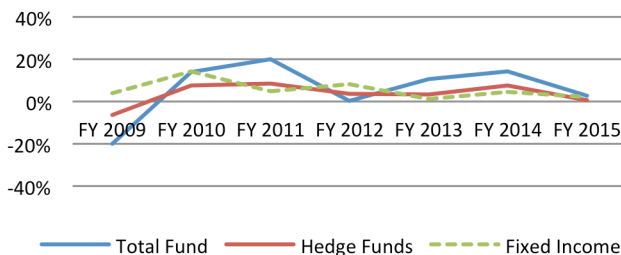
Net Returns. Over the seven fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly. We estimate that a \$100 investment in hedge funds at the beginning of FY 2009 would have grown to \$127 by the end of FY 2015, compared with \$143 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2009-2015, Maryland SRPS paid an estimated \$499 million in fees to manage its hedge fund investment—compared with only \$74 million to manage a same-sized total fund portfolio. When compared with net returns, Maryland SRPS paid an estimated 66 cents for every dollar of return to the pension fund, versus 5 cents for every dollar of net return for the total fund portfolio.

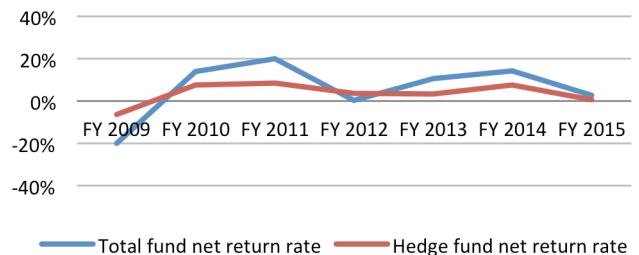
Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which PRIM trustees are unaware. This makes it difficult for pension fund trustees to assess whether Maryland SRPS' hedge fund program is producing value relative to total cost for the pension fund.



Maryland SRPS Net Return by Asset Class, FY 2009-2015



Maryland SRPS Total Fund Net Return vs. Hedge Fund Net Return, FY 2009-2015



Given the underperformance of Maryland SRPS' hedge fund investments over the last seven fiscal years, Maryland elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

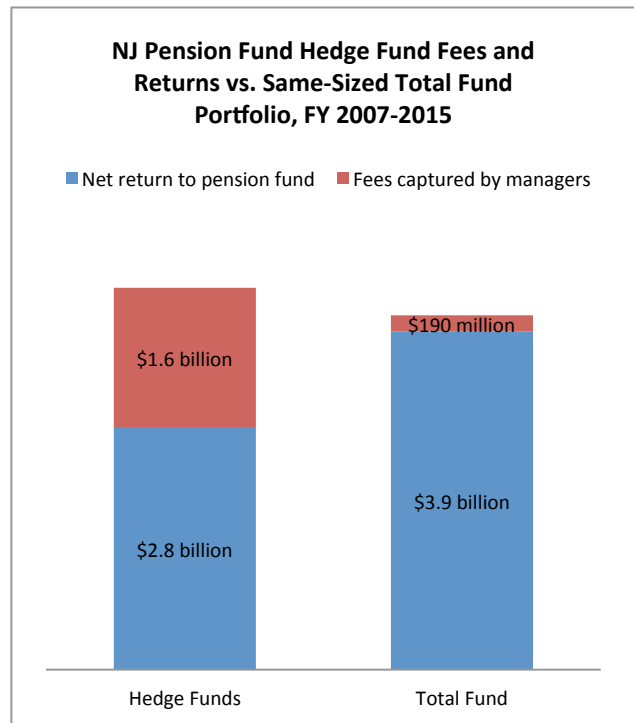
New Jersey Pension Fund

The New Jersey Pension Fund made significant investments in hedge funds beginning in fiscal year 2007, likely on the advice of hedge fund managers and consultants that hedge funds would produce absolute return and downside protection for the pension fund. Hedge fund allocations have nearly quadrupled since then, from approximately 3.1 percent in 2007 to 12.2 percent at the end of June 30, 2015. Our analysis suggests that underperformance by New Jersey’s hedge fund investments cost the pension fund an estimated \$1.1 billion in lost investment revenue over this period, giving New Jersey pension fund trustees good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

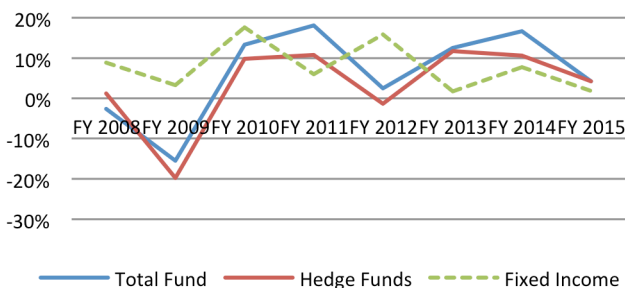
Net Returns. Over the nine fiscal years analyzed, hedge fund returns lagged same-sized total fund returns in all but three years. We estimate that a \$100 investment in hedge funds at the beginning of FY 2007 would have grown to \$146 by the end of FY 2015, compared with \$180 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds failed to provide downside protection to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2007-2015, the NJ Pension Fund paid an estimated \$1.6 billion in fees to manage its hedge fund investment—compared with only \$190 million to manage a same-sized total fund portfolio. When compared with net returns, New Jersey paid an estimated 58 cents for every dollar of return to the pension fund, versus 5 cents for every dollar of net return for the total fund portfolio.

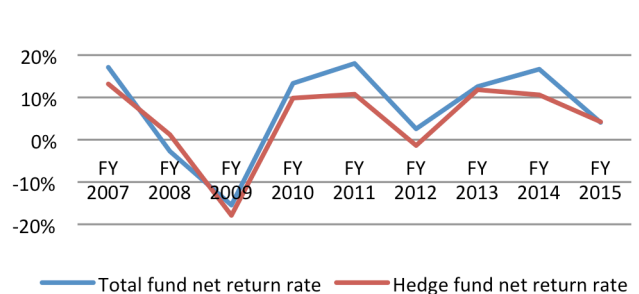
Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which NJ Pension Fund trustees are unaware. This makes it difficult for pension fund trustees to assess whether the pension fund’s hedge fund program is producing value relative to total cost for the pension fund.



NJ Pension Fund Net Return by Asset Class, FY 2008-2015



NJ Pension Fund Total Fund Net Return vs. Hedge Fund Net Return, FY 2007-2015



Given the underperformance of New Jersey’s hedge fund investments over the last nine fiscal years, New Jersey elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

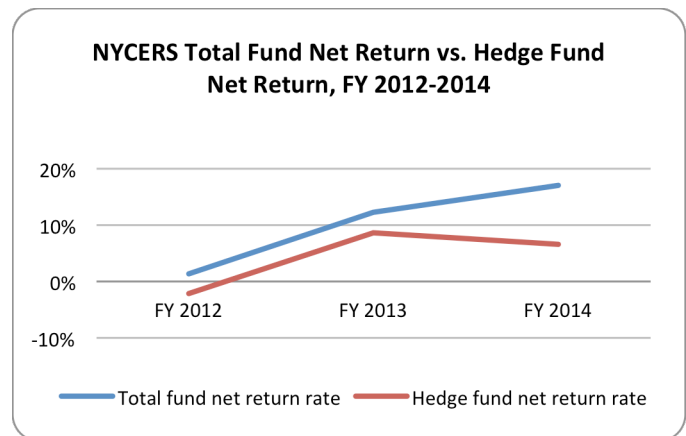
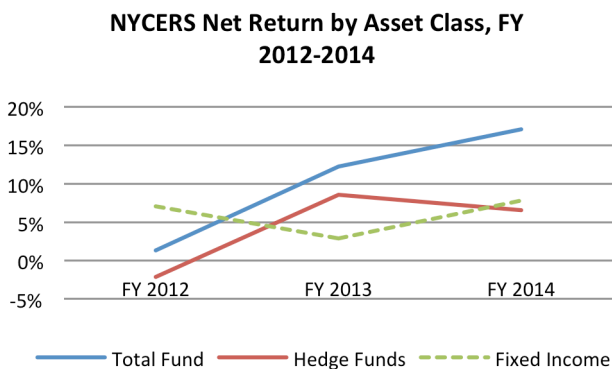
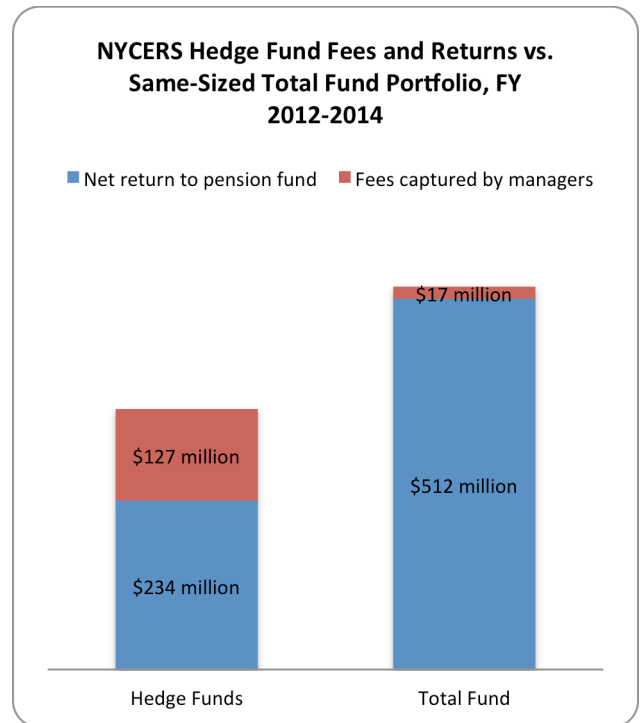
New York City Employee Retirement System

The New York City Employee Retirement System (NYCERS) made significant investments in hedge funds beginning in fiscal year 2012, likely on the advice of hedge fund managers and consultants that hedge funds would provide absolute return and downside protection to help the fund recover from losses suffered during the 2008 financial crisis. Over the following three fiscal years, hedge fund allocation grew from approximately 1.77 percent to 3.06 percent of the total fund portfolio. Our analysis suggests that underperformance by NYCERS' hedge fund investments cost the pension fund an estimated \$279 million in lost investment revenue over just three years, and now it appears that NYCERS is beginning to question both the value of an allocation to hedge funds and the fees collected by hedge fund managers.

Net Returns. Over the three fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly: We estimate that a \$100 investment in hedge funds at the beginning of FY 2012 would have grown to \$113 by the end of FY 2014, compared with \$133 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2012-2014, NYCERS paid an estimated \$127 million in fees to manage its hedge fund investment—compared with only \$17 million to manage a same-sized total fund portfolio. When compared with net returns, NYCERS paid an estimated 54 cents for every dollar of return to the pension fund, versus 3 cents for every dollar of net return for the total fund portfolio.

Fee Disclosure. In October of this year, New York City Comptroller Scott Stringer announced a new requirement that all private asset management firms, including hedge funds, would have to fully report all current and historical fee data as a condition of doing business with the city's pension funds. This important step will aid pension fund trustees in assessing whether NYCERS' hedge fund program is producing value relative to total cost for the pension fund.



Given the underperformance of NYCERS' hedge fund investments over the last three fiscal years, New York elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants, as the New York City comptroller has done.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

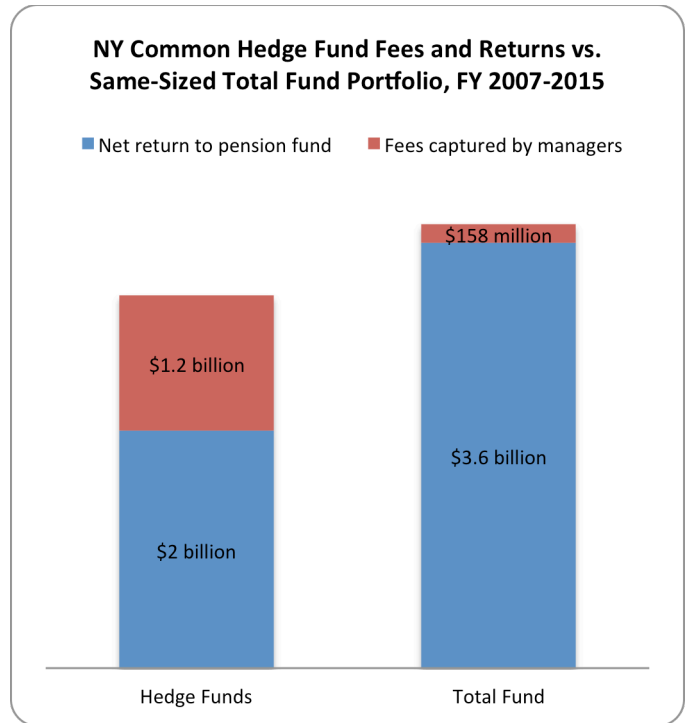
New York State Common Retirement Fund

The New York State Common Retirement Fund (NY Common) made significant investments in hedge funds beginning in fiscal year 2007 (the earliest year reported), likely on the advice of hedge fund managers and consultants that hedge funds would produce absolute return and downside protection for the pension fund. Our analysis suggests that underperformance by NY Common’s hedge fund investments cost the pension fund an estimated \$1.6 billion in lost investment revenue over this period, giving NY Common pension fund trustees good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

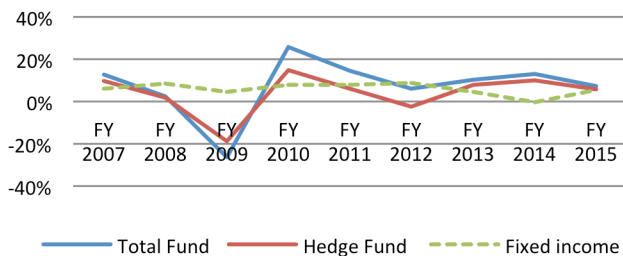
Net Returns. Over the nine fiscal years analyzed, hedge fund returns lagged same-sized total fund returns in all but one year. We estimate that a \$100 investment in hedge funds at the beginning of FY 2007 would have grown to \$135 by the end of FY 2015, compared with \$174 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, even in the 2008-2009 economic downturn, indicating that hedge funds failed to provide downside protection to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2007-2015, NY Common paid an estimated \$1.2 billion in fees to manage its hedge fund investment—compared with only \$158 million to manage a same-sized total fund portfolio. When compared with net returns, NY Common paid an estimated 57 cents for every dollar of return to the pension fund, versus 4 cents for every dollar of net return for the total fund portfolio.

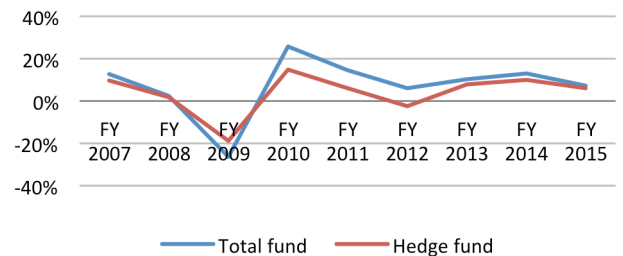
Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which NY Common trustees are unaware. This makes it difficult for pension fund trustees to assess whether the pension fund’s hedge fund program is producing value relative to total cost for the pension fund.



NY Common Net Return by Asset Class, FY 2007-2015



NY Common Total Fund Net Return vs. Hedge Fund Net Return, FY 2007-2015



Given the underperformance of NY Common’s hedge fund investments over the last nine fiscal years, New York elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

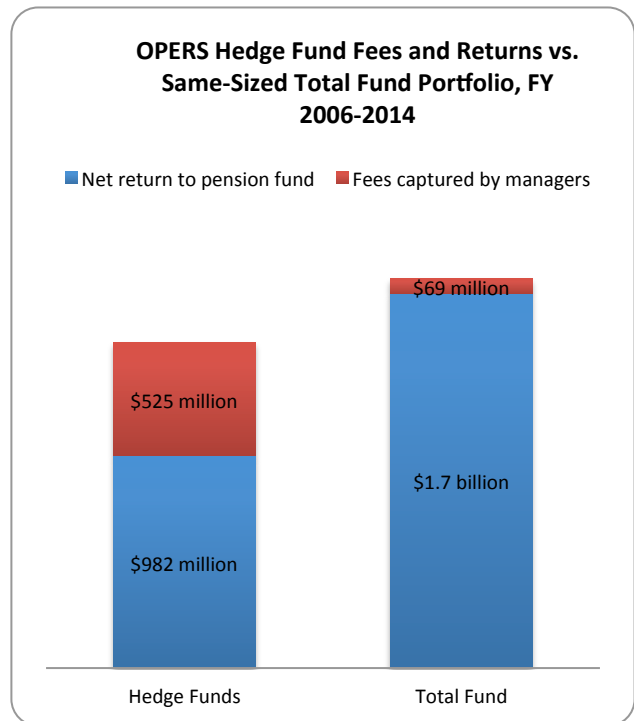
Ohio Public Employees Retirement System

The Ohio Public Employees Retirement System (OPERS) made significant investments in hedge funds beginning in fiscal year 2006, likely on the advice of hedge fund managers and consultants that hedge funds would produce absolute return and downside protection for the pension fund. Over the following nine fiscal years, hedge fund allocation grew from less than 1 percent to nearly 8 percent of the total fund portfolio. However, our analysis suggests that underperformance by OPERS' hedge fund investments cost the pension fund an estimated \$752 million in lost investment revenue over nine years, giving OPERS pension fund trustees good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

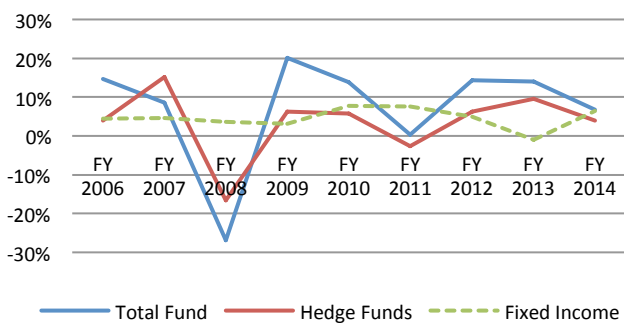
Net Returns. Over the nine fiscal years analyzed, hedge fund returns lagged same-sized total fund returns in all but two years. We estimate that a \$100 investment in hedge funds at the beginning of FY 2006 would have grown to \$132 by the end of FY 2014, compared with \$174 for the total fund over the same period. Moreover, as the charts below indicate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised—and fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2006-2014, OPERS paid an estimated \$525 million in fees to manage its hedge fund investment—compared with only \$69 million to manage a same-sized total fund portfolio. When compared with net returns, OPERS paid an estimated 54 cents for every dollar of return to the pension fund, versus 4 cents for every dollar of net return for the total fund portfolio.

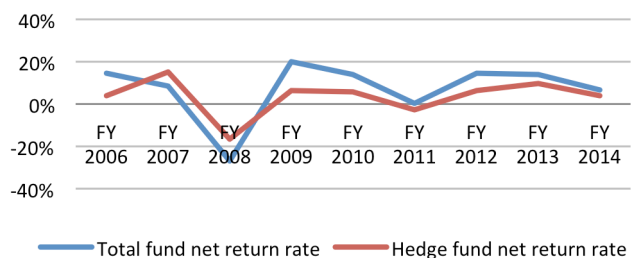
Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which OPERS trustees are unaware. This makes it difficult for pension fund trustees to assess whether the pension fund's hedge fund program is producing value relative to total cost for the pension fund.



OPERS Net Return by Asset Class, FY 2006-2014



OPERS Total Fund Net Return vs. Hedge Fund Net Return, FY 2006-2014



Given the underperformance of OPERS' hedge fund investments over the last nine fiscal years, Ohio elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

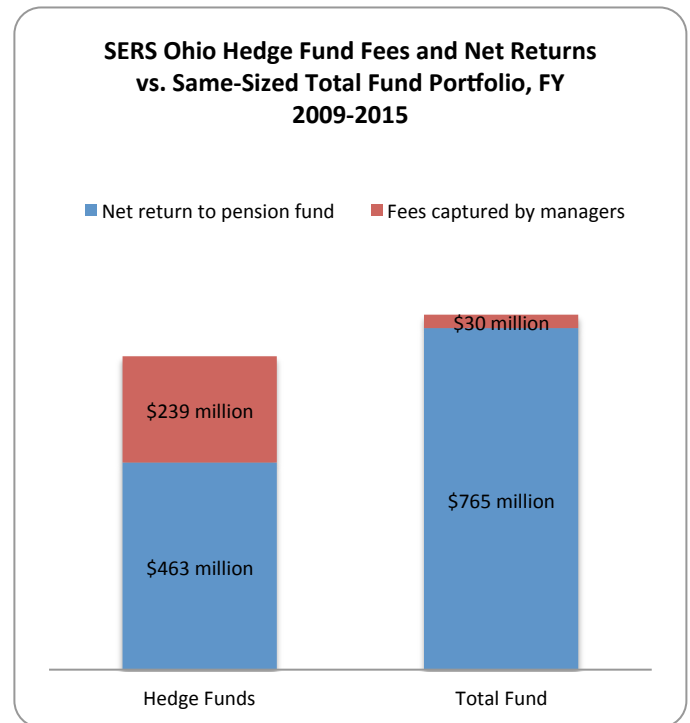
School Employees Retirement System of Ohio

The School Employees Retirement System of Ohio (SERS Ohio) made significant investments in hedge funds beginning in fiscal year 2009 (the earliest year reported), likely on the advice of hedge fund managers and consultants that hedge funds would produce absolute return and downside protection to help the fund recover from losses suffered during the 2008 financial crisis. Over the following seven fiscal years, hedge fund allocation nearly doubled, from about 6 percent to over 11.5 percent of the total fund portfolio. Our analysis suggests that underperformance by SERS Ohio’s hedge fund investments cost the pension fund over \$300 million in lost investment revenue over just seven years, giving Ohio pension fund trustees good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

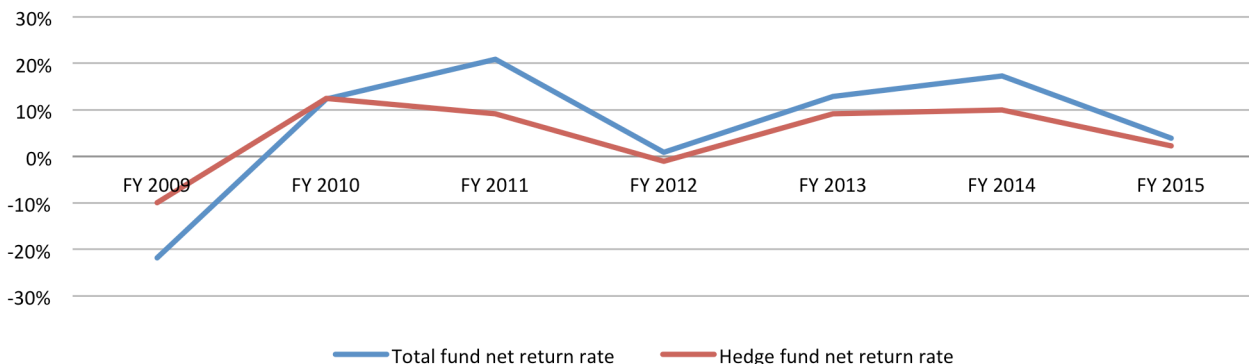
Net Returns. Over the seven fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly. We estimate that a \$100 investment in hedge funds at the beginning of FY 2009 would have grown to \$135 by the end of FY 2015, compared with \$146 for the total fund over the same period. Moreover, as the chart below illustrates, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised.

Fees. From FY 2009-2015, SERS Ohio paid an estimated \$239 million in fees to manage its hedge fund investment—compared with only \$30 million to manage a same-sized total fund portfolio. When compared with net returns, SERS Ohio paid an estimated 52 cents for every dollar of return to the pension fund, versus 4 cents for every dollar of net return for the total fund portfolio.

Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which SERS Ohio trustees are unaware. This makes it difficult for pension fund trustees to assess whether the pension fund’s hedge fund program is producing value relative to total cost for the pension fund.



SERS Ohio Total Fund Net Return vs. Hedge Fund Net Return, FY 2009-2015



Given the underperformance of SERS Ohio’s hedge fund investments over the last seven fiscal years, Ohio elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

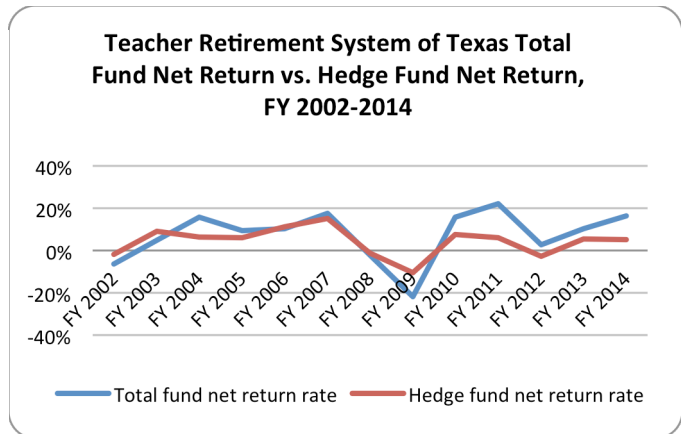
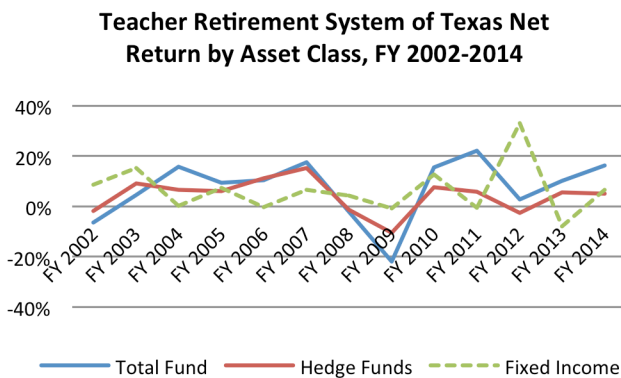
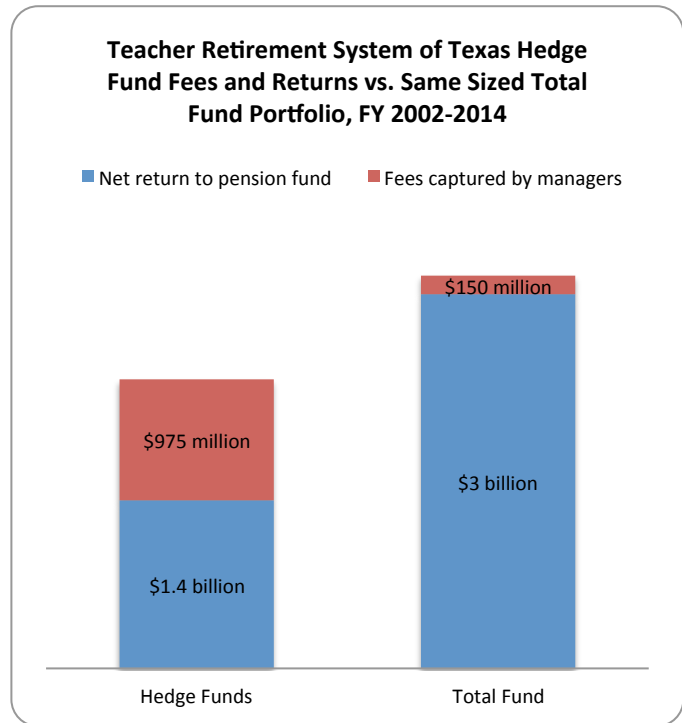
Teacher Retirement System of Texas

The Teacher Retirement System of Texas (TRST) made significant investments in hedge funds beginning in fiscal year 2002 (the earliest year reported), likely on the advice of hedge fund managers and consultants that hedge funds would produce absolute return and downside protection for the pension fund. Over the following 13 fiscal years, hedge fund allocation tripled, from approximately 1.1 percent in 2002 to 3.82 percent of the total fund portfolio at the end of fiscal year 2014. Our analysis suggests that underperformance by TRST’s hedge fund investments cost the pension fund an estimated \$1.7 billion in lost investment revenue over 13 years, giving TRST pension fund trustees good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

Net Returns. Over the 13 fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly. We estimate that a \$100 investment in hedge funds at the beginning of FY 2002 would have grown to \$169 by the end of FY 2014, compared with \$229 for the total fund over the same period. Moreover, as the charts below illustrate, hedge fund returns were significantly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised—and that fixed income investments did a better job of diversifying the fund, at a fraction of the cost.

Fees. From FY 2002-2014, TRST paid an estimated \$975 million in fees to manage its hedge fund investment—compared with only \$150 million to manage a same-sized total fund portfolio. When compared to net returns, TRST paid an estimated 72 cents for every dollar of return to the pension fund, versus 5 cents for every dollar of net return for the total fund portfolio; notably, this is the highest ratio of fees per dollar of return of all 11 funds in our analysis.

Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which TRST trustees are unaware. This makes it difficult for pension fund trustees to assess whether the pension fund’s hedge fund program is producing value relative to total cost for the pension fund.



Given the underperformance of TRST’s hedge fund investments over the last 13 fiscal years, Texas elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

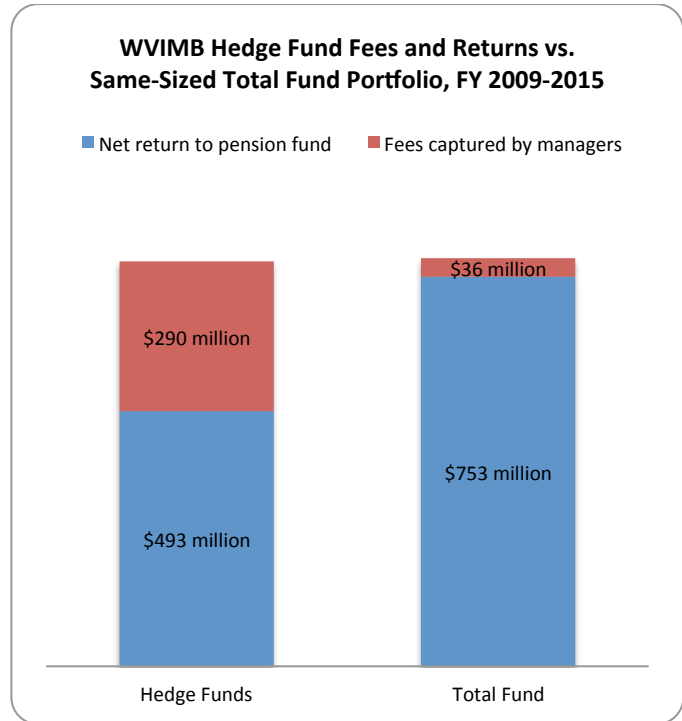
West Virginia Investment Management Board

The West Virginia Investment Management Board (WVIMB) made significant investments in hedge funds beginning in fiscal year 2009, perhaps on the advice of hedge fund managers and consultants that absolute return and downside protection would help the fund recover from losses suffered during the 2008 financial crisis. Our analysis suggests that underperformance by WVIMB’s hedge fund investments cost the pension fund an estimated \$270 million in lost investment revenue over just seven years, giving West Virginia pension fund trustees good reason to question whether its hedge fund program advocated by hedge fund managers and consultants is worth continuing.

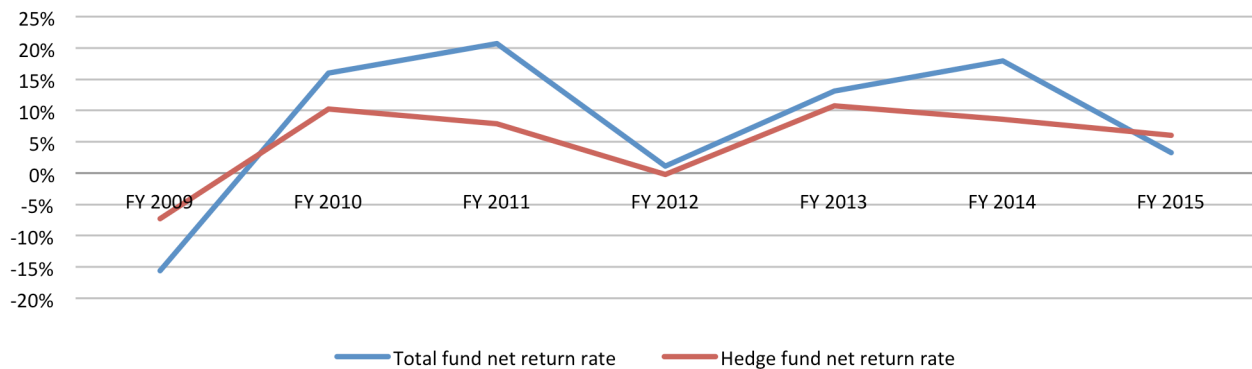
Net Returns. Over the seven fiscal years analyzed, hedge fund returns lagged same-sized total fund returns significantly. We estimate that a \$100 investment in hedge funds at the beginning of FY 2009 would have grown to \$140 by the end of FY 2015, compared with \$165 for the total fund over the same period. Moreover, as the chart below illustrates, hedge fund returns were strongly correlated to total fund returns, indicating that hedge funds did not provide diversification to the fund as promised.

Fees. From FY 2009-2015, WVIMB paid an estimated \$290 million in fees to manage its hedge fund investment—compared with only \$36 million to manage a same-sized total fund portfolio. When compared with net returns, WVIMB paid an estimated 59 cents for every dollar of return to the pension fund, versus 5 cents for every dollar of net return for the total fund portfolio.

Fee Disclosure. Reports suggest that hedge fund managers and consultants refuse to disclose all fees charged to pension systems, and there are likely additional fees of which WVIMB trustees are unaware. This makes it difficult for pension fund trustees to assess whether the pension fund’s hedge fund program is producing value relative to total cost for the pension fund.



WVIMB Total Fund Net Return vs. Hedge Fund Net Return, FY 2009-2015



Given the underperformance of WVIMB’s hedge fund investments over the last seven fiscal years, West Virginia elected officials and pension fund trustees should enact the following policies:

- Require full and public fee disclosure from hedge fund managers and consultants.
- Consider legislation and/or policies requiring full fee disclosure by hedge funds.
- Conduct an asset allocation review to examine less costly and more effective diversification approaches.

IMPLICATIONS AND RECOMMENDATIONS

Our analysis suggests that not only have pension funds consistently failed to generate excess returns over the past dozen years, they have offered investors little benefit by way of uncorrelated returns. In other words, neither of the reasons that hedge fund managers give to justify their exorbitant fee structure appear to have held up; on the contrary, investors end up doubling their losses by paying outsized fees and earning subpar returns.

This has important implications for pension fund trustees and the plans that they oversee. Among their fiduciary duties, trustees have an obligation to prudently seek out the highest long-term returns possible for the lowest possible cost. Our analysis suggests that **hedge funds cost the average pension fund included in our study \$91 million per year in lost investment revenue**, with hedge funds underperforming the total fund nearly 70 percent of the time, while charging 7.7 times more in fees than a same-sized total fund portfolio.

Notably, this is not a trend that evens out over time. Among the pension funds we analyzed, some of the most striking disparities in fees and performance between hedge funds and the total fund were evident in the funds that have been in hedge funds for the longest amount of time, including the Teacher Retirement System of Texas and the Ohio Public Employees Retirement System. This is significant, as some pension funds experiencing poor hedge fund performance claim that they haven't been invested in the asset class long enough to see the benefits.

Some pension fund trustees are starting to question whether they should invest in hedge funds at all. Indeed, while some pension funds are increasing their hedge fund investments, others are decreasing their allocations, or pulling their assets out of hedge funds completely:

- The California Public Employees' Retirement System (CalPERS), which was one of the first pension funds to invest in hedge funds, zeroed out its hedge fund portfolio in 2014, pulling out \$4 billion in investments. CalPERS cited high fees and poor performance as the reasons.³⁵
- The RBS Group Pension Fund, which manages pensions for current and former employees of the Royal Bank of Scotland and is one of the largest pension funds in the UK, has been steadily divesting from hedge funds. This is part of a risk-reduction strategy that has helped the pension fund beat its investment benchmarks for the third year in a row for the fiscal year that ended March 31, 2015.³⁶
- In early 2015, Dutch pension fund PFZW announced that it has completely divested from hedge funds, citing poor performance, high cost and complexity as the reasons for discontinuing its hedge fund program.³⁷

³⁵ Jon Hartley. "Why CalPERS is Exiting the Hedge Fund Space." *Forbes*, Sept. 22, 2014, www.forbes.com/sites/jonhartley/2014/09/22/why-calpers-is-exiting-the-hedge-fund-space/.

³⁶ Mark Cobley. "RBS Scheme Slashes Hedge Funds as Outperformance Rolls On," *Financial News*, Sept. 4, 2015, www.efinancialnews.com/story/2015-09-04/rbs-pension-fund-outperforms-third-year-running.

³⁷ Miles Johnson, "Dutch Pension Scheme Pulls €4bn Hedge Funds Investment," *Financial Times*, Jan. 9, 2015, www.ft.com/cms/s/0/718b68f4-9818-11e4-a495-00144feabdc0.html#axzz3pgB39Rkr.

- In early 2014, Nevada PERS terminated its hedge fund program, questioning the ability of hedge funds to beat the market.³⁸
- Earlier this year, San Francisco’s pension fund voted against increasing its hedge fund allocation to 15 percent as proposed by investment staff.³⁹

The trend of pension funds reviewing their hedge fund investments and in some cases deciding to divest from the investment class altogether could easily accelerate, especially given recent findings in Preqin’s June 2015 survey of hedge fund investors and managers. Those findings indicate that 33 percent of investors said they were thinking of investing less in hedge funds over the next 12 months. Performance was identified by 44 percent of hedge fund investors and 22 percent of hedge fund managers as a key issue facing the industry. The percentage of investors who believed that hedge funds managers’ interests were aligned with their own fell from 69 percent to 51 percent.⁴⁰

IMPLICATIONS FOR PLAN PARTICIPANTS AND TEACHER AND PUBLIC EMPLOYEE UNIONS

According to our analysis, **hedge funds cost the average pension fund we reviewed \$81 million per year in fees.** These largely undisclosed fees come directly out of workers’ own retirement savings and lower future retirement income. Overly burdensome fees can contribute to pension shortfalls, which in turn can put additional pressures on city and state budgets (for example, the current situations in Illinois and New Jersey, among others).

Ultimately, these disproportionately high fees result in a direct transfer of wealth from taxpayers and workers to wealthy hedge fund managers. Because hedge fund fees account for some of the heftiest fees that pension funds pay to investment managers, pension plan participants—and the teacher and public employee unions that represent them—are justly questioning whether continuing to invest workers’ retirement savings in hedge funds makes good fiduciary sense.

CONCLUSION

Although hedge fund managers have convinced many investors that they provide investment products so uniquely profitable that extraordinarily high fees are warranted, our research suggests that there is little evidence to back up these claims. On the contrary, our analysis suggests that hedge funds as an investment product fall short of both of their major selling points: outsized returns that offset the

³⁸ Ron Lieber, “Pension Advisers Learn the Folly of Trying to Beat the Market,” *New York Times*, Aug. 21, 2015, www.nytimes.com/2015/08/22/your-money/pension-advisers-learn-the-folly-of-trying-to-beat-the-market.html?_r=0.

³⁹ Kathleen Pender. “S.F. Pension System Votes to Invest 5% in Hedge Funds.” *SF Gate*, Feb. 11, 2015, www.sfgate.com/bayarea/article/SF-pension-system-votes-to-invest-5-in-hedge-6076365.php.

⁴⁰ Amy Bensted, “Hedge Fund Performance Is Primary Industry Concern for Managers and Investors,” *Hedgework*, April 9, 2015, www.hedgework.com/2015/09/04/229588/hedge-fund-performance-primary-industry-concern-managers-and-investors.

exorbitant fees, and uncorrelated returns that smooth out market volatility and offer investors protection during economic downturns.

In our study of 11 U.S. public pension funds, we found that hedge funds outperformed the total fund only a little over a quarter of the time while charging more than 7.7 times higher fees than a same-sized total fund portfolio, costing the funds an estimated \$7.1 billion in fees and \$8 billion in lost investment revenue over the life of their hedge fund investments to date. Furthermore, we found that hedge fund manager fees siphoned off an estimated 57 cents of every dollar of net return to the pension funds, compared with 5 cents in management fees per dollar of net return for a same-sized total fund portfolio.

Sheelah Kolhatkar at *Bloomberg* perhaps put it best: “No matter how many \$100 million Picasso paintings they purchase, hedge fund moguls are not magicians. The sooner investors realize that, the better off they will be.”⁴¹

Given the strength of our findings, we recommend that pension fund trustees take the following steps to gain a more complete picture of how their hedge fund investments have performed and assess whether it is worth continuing to invest pensioners’ savings in the asset class:

- **Conduct an asset allocation review to examine less costly and more effective diversification approaches.** The review should include a complete analysis of past net performance of their hedge fund investments, as well as a comparison to low-fee alternatives.
- **Require full and public fee disclosure from hedge fund managers and consultants.** This disclosure should include all fees—management, incentive and otherwise—and should include complete disclosure of historical investment fees captured by hedge fund managers for the duration of their fund’s investments. Pension funds should also consider developing legislative policies requiring this level of disclosure.

Measures such as these will ensure that hedge funds and hedge fund consultants provide public pension funds as well as the public with clear and accurate representations of hedge fund performance, and will aid pension fund trustees in fulfilling their fiduciary duty to allocate workers’ retirement savings to those investments that produce the most reliably high returns at the lowest cost to the pension fund.

⁴¹ Sheelah Kolhatkar, “Calpers Has Had It With Hedge Funds,” *Bloomberg Businessweek*, Sept. 15, 2014, www.bloomberg.com/bw/articles/2014-09-15/calpers-has-had-it-with-hedge-funds.

REPORT AUTHORS

Roosevelt Institute

Until economic and social rules work for all, they're not working. Inspired by the legacy of Franklin and Eleanor, the Roosevelt Institute reimagines America as it should be: a place where hard work is rewarded, everyone participates, and everyone enjoys a fair share of our collective prosperity. We believe that when the rules work against this vision, it's our responsibility to recreate them.

We bring together thousands of thinkers and doers—from a new generation of leaders in every state to Nobel laureate economists—working to redefine the rules that guide our social and economic realities. We rethink and reshape everything from local policy to federal legislation, orienting toward a new economic and political system: one built by many for the good of all.

ReFund America Project (RAP)

The ReFund America Project tackles the structural problems in the municipal finance system that cost state and local governments across the United States billions of dollars each year at the expense of public services. We research the role of financial deals in contributing to public budget distress and work with policy experts, community leaders, and public officials to develop, advocate for, and implement solutions to help save taxpayer dollars.

AFT

The American Federation of Teachers, an affiliate of the AFL-CIO, was founded in 1916 and today represents 1.6 million members in more than 3,000 local affiliates nationwide. In addition, the AFT represents approximately 80,000 early childhood educators and nearly 250,000 retiree members. AFT conducted and provided the pension fund research and analysis for this report.

Haas Institute for a Fair and Inclusive Society

The Haas Institute for a Fair and Inclusive Society at UC Berkeley brings together researchers, organizers, stakeholders, communicators, and policymakers to identify and eliminate the barriers to an inclusive, just, and sustainable society and to create transformative change toward a more equitable nation.

Appendix: Methodology

We analyzed a set of 11 public pension funds, with a total of \$638 billion in assets under management (AUM) and \$43 billion in hedge fund AUM as of the most recent fiscal year reported. The average pension fund in this group had \$58 billion in total fund AUM and \$3.9 billion in hedge fund AUM for the most recent fiscal year reported. The median pension fund has been in hedge funds for 9 years; the average is 8 years. The average pension fund in our study had a hedge fund allocation of 8.6 percent of the total portfolio; the median had a hedge fund allocation of 9.7 percent.

Hedge funds and consultants typically fail to disclose all information related to the fees they charge to pension funds. When they do disclose these fees, the figures are often unreliable, either because they fail to account for all fees (management, performance, pass-through and otherwise), or because the terms of the investment contracts preclude pension funds from having the right to know about these fees in the first place. Therefore, this analysis uses the following methodology to estimate these costs:

1. Gross hedge fund returns are calculated using the following assumptions:
 - Hedge fund management fees are calculated conservatively at 1.8 percent of assets under management (AUM).
 - Hedge fund incentive fees are calculated conservatively at 18 percent of gross return less management fees.
2. In cases where the pension fund's investment in hedge fund of funds represented 25% or more of its total hedge fund portfolio according to the most recent Preqin records, we included a modest increase in management (.2 percent), and incentive (2 percent) fees to account for added fees above and beyond underlying hedge fund fees associated with hedge fund of funds.
3. Total fund cost is estimated conservatively at 40 basis points of AUM. The average total fund cost for U.S. pension funds including hedge fund fees is 46.8bp;⁴² for U.S. state pension funds the figure is 41bp;⁴³ 40bp is used assuming no hedge fund fees.
4. Performance fees were adjusted for fiscal years where high water marks needed to be met (i.e. fiscal years following a fiscal year of negative hedge fund net returns). High water marks were accounted for based on the entire hedge fund portfolio because individual fund high water marks are not public.

Sample selection

Beginning with a list of the 60 largest public pension funds in terms of AUM, we selected the pension funds included in this report based on the following factors:

⁴² See White, "Do Pension Funds Add Value?"

⁴³ Mike Maciag, "By the Numbers: Are State Pension Funds Paying Wall Street Too Much?" *Governing*, Aug. 15, 2012, www.governing.com/blogs/by-the-numbers/gov-state-pension-funds-pay-wall-street-investment-fees.html.

- **Amount and duration of hedge fund investment.** We excluded pension funds that did not currently have any hedge fund investments (e.g. CalPERS) and pension funds with less than four years of hedge fund investment.
- **Type of public pension fund.** We excluded city and county pension plans from our analysis, with the exception of NYCERS, which was the 15th-largest public pension fund on our list and therefore large enough to warrant inclusion in our study.
- **Availability of net return data.** For each of the remaining public pension funds on our list, we sought to obtain AUM and net return data for both the total fund and hedge fund investments for each fiscal year that the fund was invested in hedge funds. This information was not uniformly available publicly, and therefore we submitted public records request for this information to a majority of these funds.
- **Geography.** In seeking net return and AUM data, we omitted pension funds from the following states: Alaska, Arizona, Delaware, Kentucky, Louisiana, Michigan, New Mexico, South Carolina, South Dakota and Tennessee.

This selection process resulted in a set of 11 public pension funds for which we had sufficient data to conduct a fees and returns analysis. All 11 of these pension funds are included in this report, both individually and in the aggregate.

The 11 pension funds included in this report are reasonably representative of the original pool of the 60 largest public pension funds, as illustrated in this table:

	Report sample	60 largest public pension funds
Average AUM	\$58 billion	\$40.7 billion
Average hedge fund AUM	\$3.9 billion	\$2.6 billion
Average allocation to hedge funds	8.65%	8.25%
Median allocation to hedge funds	9.7%	6.8%

Limitations

Our analysis was limited principally by availability of data. Because many pension funds do not make hedge fund AUM and net return data clear and easily accessible to the public, we had to submit public records requests to obtain data from many of the public pension funds we hoped to review. Timeliness and adequacy of responses we received varied widely, so we were able to include only those funds for which we had data. As the table above illustrates, our sample skews slightly larger in terms of dollar size of fund and hedge fund allocation, as well as median hedge fund allocation percent.

Similarly, by omitting many pension funds located in the south and central United States, our sample is biased toward East Coast and Great Lakes region pension funds.

Comparing hedge fund net return rates with total fund net return rates provided a better way to assessing hedge fund performance than comparing hedge fund return rates with the S&P 500. However, the total fund portfolio for each of the pension funds in our study included an allocation to private

equity, an asset class that has been criticized for reporting artificially high returns to investors. This leaves open the possibility that the total fund net return figures we used for comparison purposes were artificially high due to private equity.

To test for this, we compared the average total fund net return for three pension funds not invested in private equity (the Teachers’ Retirement System of Georgia, the Arkansas Public Employee Retirement System, and the Employees’ Retirement System of Georgia) from fiscal years 2005-2014 (2015 data was unavailable for all of these funds), with the average total fund net returns of the 11 pension funds in our analysis. We found that the four pension funds without private equity allocations had higher total fund net returns than the 11 pension funds in our study in 4 out of 10 years reviewed. These results indicate that the total fund net rates of return in our study were likely not unduly inflated by over-reported private equity net returns.

	Report Sample Avg. Total Fund Net Return	Non-PE Sample Avg. Total Fund Net Return
FY 2005	11.21%	8.83%
FY 2006	13.31%	9.22%
FY 2007	15.39%	15.77%
FY 2008	-6.27%	-2.84%
FY 2009	-16.18%	-11.75%
FY 2010	14.73%	8.51%
FY 2011	16.20%	17.15%
FY 2012	3.63%	1.02%
FY 2013	12.50%	10.55%
FY 2014	14.24%	10.52%

Additional notes on specific funds:

We obtained AUM and net return data for each pension fund’s hedge fund and total fund investments from the following sources: comprehensive annual financial reports (CAFRs) for the pension funds, investment reports, websites and/or public records requests. The following table provides more detailed information on data sources for each specific fund:

Employees’ Retirement System of Rhode Island
<ul style="list-style-type: none"> All data obtained from Rhode Island State Investment Commission Monthly Report for July of each year, available here: treasury.ri.gov/investor-relations/state-investment-commission-reports/
Illinois State Board of Investment
<ul style="list-style-type: none"> Hedge funds of funds were estimated to average over 25 percent of hedge fund AUM for all years based on public reports. A modest increase in management (0.2 percent), and incentive (2 percent) fees were included to account for ISBI’s greater than 25 percent investment in hedge fund of funds where added fees above and beyond underlying hedge fund fees are paid. All 2015 data (preliminary) obtained through a public records request to ISBI; all other data obtained from CAFRs, available here: www.illinois.gov/isbi/Pages/Reporting.aspx
Maryland State Retirement and Pension Plan
<ul style="list-style-type: none"> All data for fiscal years 2009-2014 obtained from CAFRs.

<ul style="list-style-type: none"> • FY 2015 net return data obtained from a July 21, 2015 press release from Maryland SRPS, “Maryland State Retirement Agency Reports Earnings on Investments in FY 2015” (available here: www.sra.maryland.gov/News/2015/Default.aspx); 2015 AUM data obtained from Maryland SRPS Quarterly Investment Update from June 30, 2015 (available here: www.sra.maryland.gov/Agency/Investment/Downloads/Default.aspx) • Maryland began reporting hedge fund (“absolute return”) data in FY 2009; while the 2008 CAFR indicates a target allocation of 0%-5%, it is unclear whether Maryland SRPS had a hedge fund allocation prior to FY 2009.
Massachusetts Pension Reserves Investment Management Board
<ul style="list-style-type: none"> • All data for fiscal years 2005-2014 obtained from Mass PRIM CAFRs. • 2015 data obtained from the June 2015 performance summary. • All data available on the Mass PRIM website: www.mapension.com/publications/
New Jersey Pension Fund
<ul style="list-style-type: none"> • Hedge funds of funds were estimated to average 25 percent of hedge fund AUM for all years based on public reports. A modest increase in management (0.2 percent), and incentive (2 percent) fees were included to account for New Jersey’s 25 percent investment in hedge fund of funds where added fees above and beyond underlying hedge fund fees are paid. • 2008 hedge fund net return rate was missing from the publicly available sources. A proxy rate of 1.21 percent was used, representing the average hedge fund net return of the Illinois Teachers Pension Fund and Alaska PERS — both pension funds invested in hedge funds and hedge fund of funds, and reporting net hedge fund returns for FY 2008. NOTE: this is the only data point in our report that is a proxy, and we believe that this proxy is adequate; it is incumbent upon the NJ State Investment Council to make this rate of return available to the public, which to date they have failed to do. • 2007 fixed income net return data was not available, so we omitted 2007 from our fixed income analysis. • All data obtained from NJ State Investment Council annual reports and monthly investment reports, available here: www.state.nj.us/treasury/doinvest/directorsreports.shtml
New York City Employee Retirement System
<ul style="list-style-type: none"> • All data obtained from CAFRs, available here: www.nycers.org/%28S%28mhoxqy45mtw2bwyfbtoxu355%29%29/about/CAFR.aspx • FY 2015 hedge fund net return rate was not available, so FY 2015 data was omitted from this analysis.
New York State Common Retirement Fund
<ul style="list-style-type: none"> • All data for fiscal years 2007-2014 obtained from CAFRs • FY 2015 data obtained from the May 15, 2015 press release from NY Common Retirement Fund, “DiNapoli: State Pension Fund Reaches Record High of \$183.5 Billion,” available here: www.osc.state.ny.us/press/releases/may15/052215.htm
Ohio Public Employees Retirement System
<ul style="list-style-type: none"> • Hedge fund AUM and net return rates obtained through a public records request to OPERS; total fund AUM from CAFRs (“Total Investment Summary by Portfolio” chart). • Total fund figures refer to the “total portfolio” category in OPERS reports.
School Employees Retirement System of Ohio
<ul style="list-style-type: none"> • Total fund data for FY 2015 obtained from the SERS Ohio website (https://www.ohsers.org/investments-4); total fund data for all other fiscal years obtained from CAFRs. • Hedge fund AUM data for FY 2008, FY 2009 and FY 2015 obtained through a public records request to SERS Ohio; hedge fund AUM data for all other fiscal years obtained from CAFRs.

- All hedge fund net return rates were obtained through a public records request to SERS Ohio.

Teacher Retirement System of Texas

- All data obtained from CAFRs, "Stable Value Hedge Funds" category, available here:
www.trs.state.tx.us/info.jsp?submenu=publications&page_id=/about/archive_annual_report

West Virginia Investment Management Board

- All data from the following sources: WVIMB Participant Plan Allocation and Performance Net of Fees for 2007-2011; WVIMB Schedule of Investment Performance for 2012-2014; WVIMB Participant Plan Performance Report Preliminary 2015; and WVIMB annual reports. Available here:
www.wvimb.org/Reports.aspx