

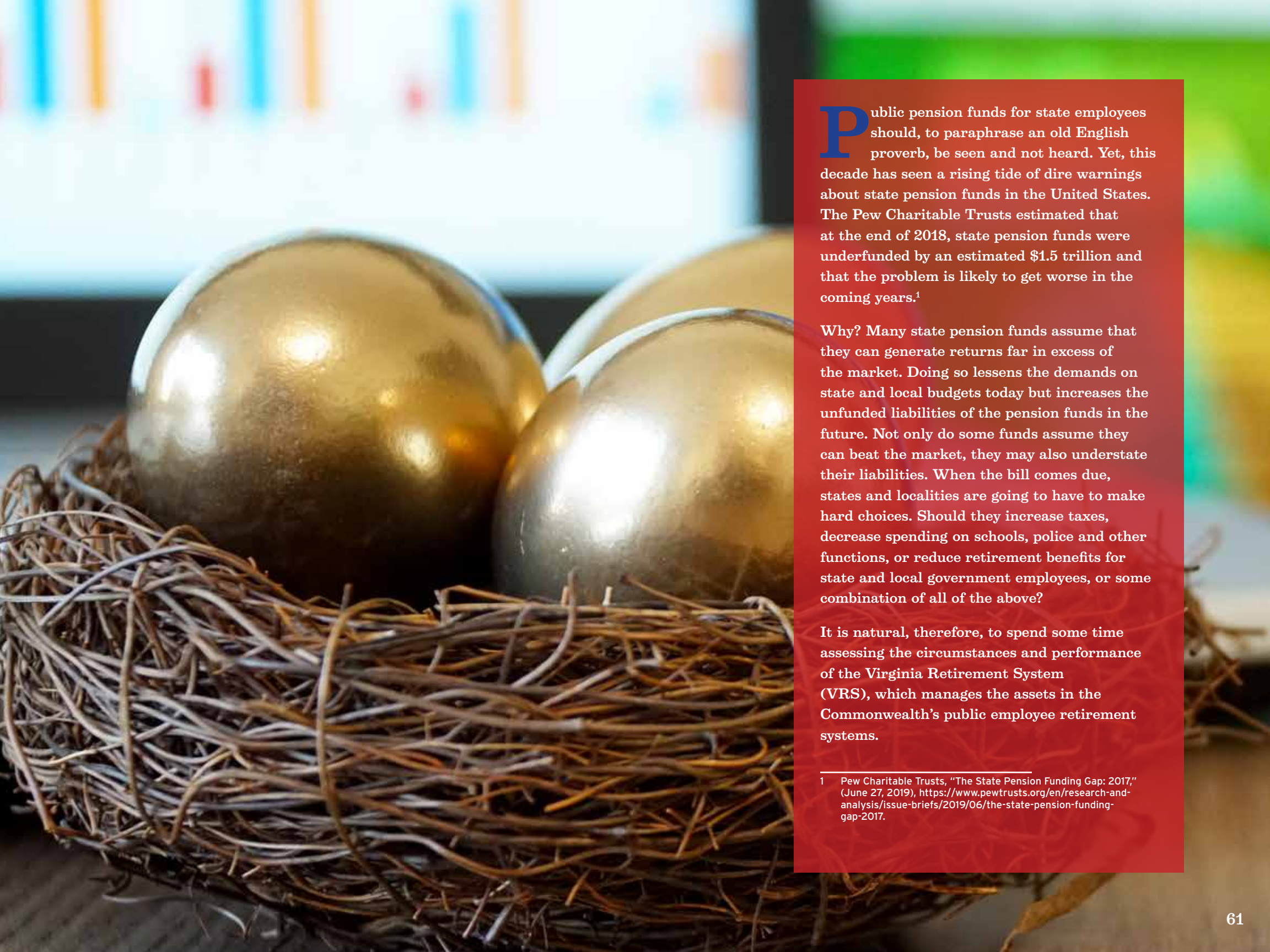
THE VIRGINIA RETIREMENT SYSTEM: ASSESSING ITS CHALLENGES AND CHARTING ITS FUTURE

The funded status of the VRS plans has improved in recent years, in part because of strong investment performance.

– Joint Legislative Audit and Review
Commission, December 2017

The VRS is actuarially sound.

– GRS Retirement Consulting report,
July 9, 2018



Public pension funds for state employees should, to paraphrase an old English proverb, be seen and not heard. Yet, this decade has seen a rising tide of dire warnings about state pension funds in the United States. The Pew Charitable Trusts estimated that at the end of 2018, state pension funds were underfunded by an estimated \$1.5 trillion and that the problem is likely to get worse in the coming years.¹

Why? Many state pension funds assume that they can generate returns far in excess of the market. Doing so lessens the demands on state and local budgets today but increases the unfunded liabilities of the pension funds in the future. Not only do some funds assume they can beat the market, they may also understate their liabilities. When the bill comes due, states and localities are going to have to make hard choices. Should they increase taxes, decrease spending on schools, police and other functions, or reduce retirement benefits for state and local government employees, or some combination of all of the above?

It is natural, therefore, to spend some time assessing the circumstances and performance of the Virginia Retirement System (VRS), which manages the assets in the Commonwealth's public employee retirement systems.

¹ Pew Charitable Trusts, "The State Pension Funding Gap: 2017," (June 27, 2019), <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2019/06/the-state-pension-funding-gap-2017>.

Our work in this chapter is an independent, noncommissioned, noncompensated analysis of specific issues relating to the VRS. The available evidence suggests that the VRS has been well managed and has outperformed many state pension funds. Fortunately for the members of the VRS and the taxpayers of Virginia, the VRS has avoided most of the difficulties that have afflicted many other state pension plans.

Our work benefited immensely from face-to-face conversations with VRS officials. We did not always find ourselves in agreement with the views of the VRS on all issues, but one must credit the VRS for its willingness to engage and to respond to our queries. More public agencies should emulate it in this regard.

We suggest four policy changes that would improve the performance of the VRS, reduce the likelihood that the Commonwealth will confront serious problems in the future and ultimately benefit its participants.² One of these changes would have the VRS rely more on low-cost, indexed public equity investments instead of paying analysts to actively manage the same funds. If the VRS had followed this strategy, we estimate it could have earned an additional \$3.4 billion on its public equity portfolio between 1992 and 2017. There may be additional gains from indexing other segments of the VRS portfolio, but we do not deal with those possibilities in this chapter.

Some Background

The VRS manages and invests pension funds sent to it by public bodies in Virginia. On March 31, 2019, the VRS served more than 722,000 members, retirees and beneficiaries and held \$80.4 billion in net assets. VRS payments to recipients included \$4.75 billion in retirement benefits and another \$416 million in other postretirement benefits.³ The VRS ranks as the 15th-largest public pension systems in the United States.

Because the VRS is overseen by the Virginia General Assembly, it often ends up having to play the financial cards dealt it by legislators. These

cards historically included inadequate funding by the General Assembly of the state's public employee pension plans. Consequently, the VRS is "underfunded"; that is, its current asset holdings, prudently invested, are insufficient to produce the income required to meet anticipated future obligations. **On June 30, 2018, the market value of the assets held by the VRS was equal to only 78.1% of its actuarially accrued liabilities.⁴**

On the plus side, however, the General Assembly has, in recent years, met its financial obligations to its pension funds. The General Assembly also (wisely, in our view) established an independent board to govern the VRS. There is widespread agreement that the independent board has improved the management and performance of the VRS, enabled it to attract and retain superior personnel, and increased its reputation among lawmakers, financial professionals and the public.

The General Assembly determines what kind of public employee retirement benefits Virginia offers. In recent years, it has exercised its authority to move the Commonwealth away from exclusive reliance upon "defined benefit" pension programs (that guarantee participants specific future benefits) toward hybrid programs that include both defined benefit provisions and "defined contribution" provisions. Under defined contribution programs, the Commonwealth places pension contributions into accounts that the participants subsequently own. The Commonwealth's financial liability ends there, a circumstance that is not true when employees are in defined benefit programs. In the latter case, the Commonwealth is obligated to fund previously agreed upon benefits over what sometimes can be long time periods.

Most new VRS participants, except for hazardous duty employees, now are automatically enrolled in the hybrid retirement plan. The federal government and the private sector moved in this direction some years ago. Now, all but a few private-sector employers provide defined contribution programs rather than defined benefit programs. While defined benefit pension programs contain some attractive features for both the Commonwealth and participants, they have become the source of significant fiscal stress in numerous states because the financial obligations

² A July 9, 2018, audit of the VRS by GRS Retirement Consulting declared the VRS "actuarially sound," file:///H:/State%20of%20the%20Commonwealth%202018/Pensions/VRS%20Audit%20July%209,%202018.pdf.

³ Joint Legislative Audit and Review Commission, VRS Oversight Report (July 2019), <http://jlarc.virginia.gov/pdfs/reports/Rpt521-2.pdf>.

⁴ Virginia Retirement System, Comprehensive Financial Annual Report, 2018.

of the states to employees carry on long into the future. Defined benefit plans threaten to bankrupt states, such as Illinois. Hence, moving Virginia away from defined benefit pension programs is a change essential to the future fiscal stability of the Commonwealth and its local government units.

While each state has its own distinctive pension fund, there are common characteristics among these funds. Funds that have encountered financial difficulties have done so because of one or more of the following decisions:

1. Overly generous pension and attached health care provisions benefitting public employees,
2. Generous cost-of-living adjustments that exacerbate funding challenges,
3. Grossly inadequate funding of pension obligations by governors and legislatures,
4. Overly optimistic rate of return assumptions for their investable assets that match neither experience nor the likely future, and
5. Excessive investment of assets in costly actively managed funds that have performed poorly relative to the overall market.

If there is a lesson here, it is that problems in state pension funds characteristically are ignored by those in power, build slowly over time and then emerge as full-blown crises. Timely action now on the part of the Commonwealth can reduce the risk that the VRS might drift into trouble in the future. Attempting to address the vulnerabilities of the VRS will be more difficult when the next economic recession inevitably appears.

Virginia's Public Employee Pension Systems

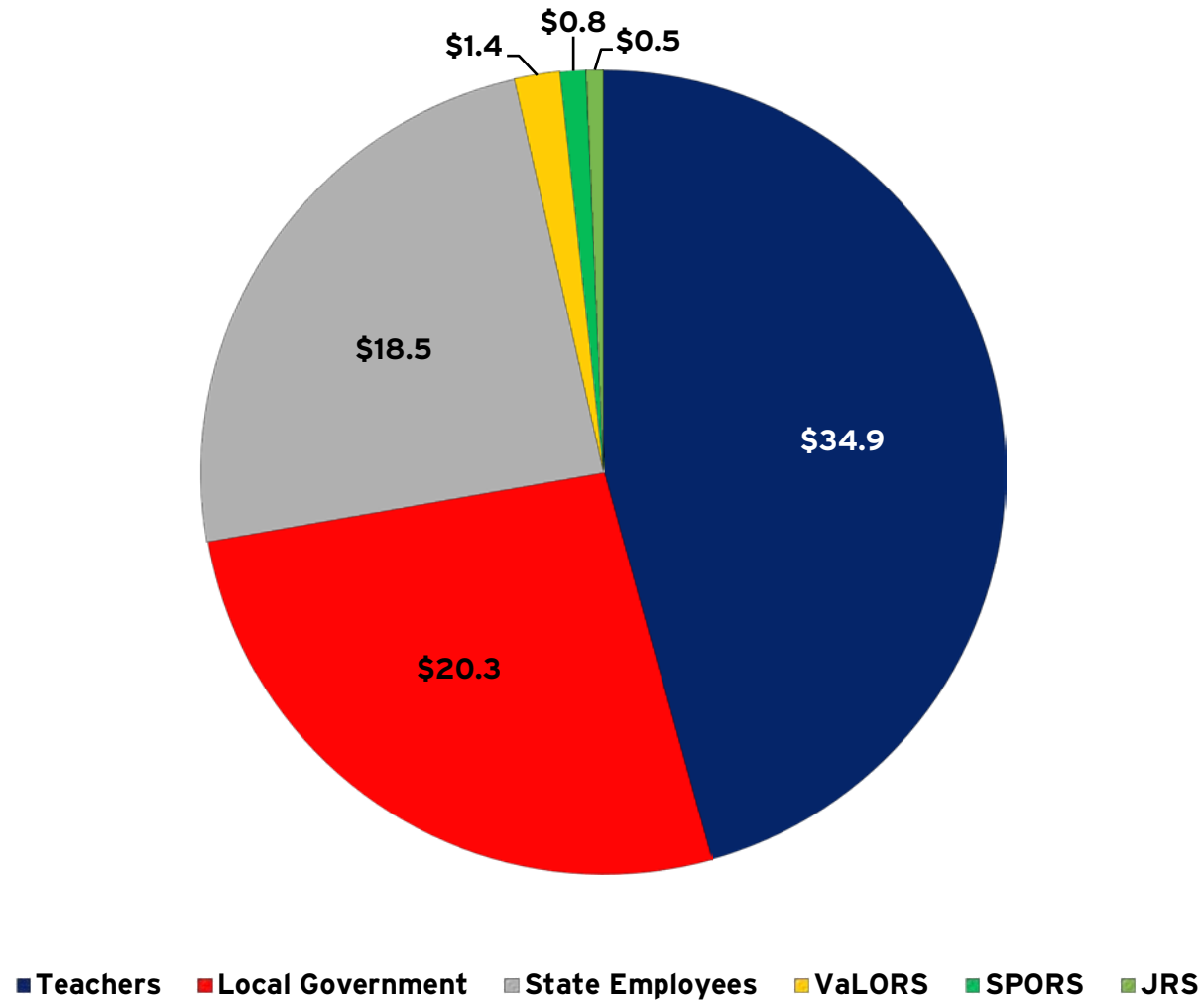
The Commonwealth maintains six different public employee pension systems: (1) the system that serves most state government employees, who are or were located in 227 state agencies; (2) the system that serves about 600 special governmental authorities, cities, towns and school divisions; (3) the state teachers' retirement system, which is the largest of the six; (4) the state police officers' retirement system (SPORS); (5) the Virginia law officers' retirement system (VaLORS); and (6) the judicial retirement system (JRS). The VRS manages all state pension funds, whose individual members (current or prospective retirees) totaled more than 722,000 in March 2019.

Graph 1 reports the net asset positions at the end of the 2018 fiscal year for each of the major pension systems that comprise the VRS. The VRS invests the money sent to it by jurisdictions that range from towns, cities and counties to school districts and economic development agencies. The combined assets of the different systems are invested jointly. However, the VRS only can invest funds that it receives from local government bodies. If an employer does not fully fund its contractual obligations to its current and former employees, then this is a problem that will accrue to the employer instead of the entire VRS system. According to the VRS, the average funding level of local government pension systems managed by the VRS was 92.2% in summer 2018.⁵ However, funding levels varied – from the town of Haysi in Dickenson County, having assets valued at only 42.34% of its anticipated obligations; to Loudoun County, at 91.39%; to Newport News, at 125.69%.⁶

⁵ Information provided in a communication from the VRS to Old Dominion University's Dragas Center for Economic Analysis and Policy.

⁶ Virginia Retirement System, "Actuarial Valuation of Political Subdivisions," (June 30, 2017).

GRAPH 1
EMPLOYERS' NET PENSION LIABILITY OF THE MAJOR COMPONENTS OF THE VIRGINIA RETIREMENT SYSTEM
(BILLIONS OF \$)



Source: Virginia Retirement System, Comprehensive Financial Annual Report (June 30, 2018)

Income pensioners receive from the VRS comes from two primary sources: (1) the financial contributions of workers and employers covered by the VRS; and (2) the income earned by the VRS from the assets it invests. Nationally, investment earnings typically provide about 61% of promised benefits, but were 67% for the VRS in 2016. Higher investment income percentages can reflect greater investment success or lower contribution levels, or both.⁷

Unfunded Liabilities

At first glance, the financial economics associated with pension funds are simple. Employers and employees contribute money to a fund that invests those funds to support payments to the employees, typically when they retire. To the extent that employers make more generous financial promises than they can keep to their employees concerning the size and duration of their retirement stipends, then employers and their employees either must contribute more money, or higher rates of return must be earned on the funds being invested on behalf of the employees. In Virginia, the benefits VRS participants receive are determined by state statute.

When the funds on hand to deal with anticipated future retirement obligations are insufficient to meet those obligations, then this is called an unfunded actuarial accrued liability (UAAL) in pension fund parlance. “Anticipated” is an important modifier in the previous sentence. Among other things, the moneys that must be paid out by pension funds depend on the salaries that employees will earn, when employees choose to retire, whether they are eligible by statute to claim disability, and how long they live. Alas, none of these events can be known with certainty.

Roughly two-thirds of Americans have left the labor force by age 66, and half leave the labor force between ages 61 to 65. Retirement ages tended to decline in the United States until the economic reverses of the Great Recession and changes in Social Security eligibility altered the calculations for many individuals. Data from the U.S. Census’ 2018 American Community Survey tell us that the average retirement age for Virginians was 65.

The lengthening life span of Americans poses a significant challenge to the viability of many state pension funds. The expected life span of a newly born baby was 70.8 years in 1970 but had risen to 78.6 by 2017.⁸ Simply put, when pension recipients live longer, a larger asset base is required to take care of them.

Public employee pension funds in most states have UAALs. Graph 2 reveals that as of June 30, 2018, the VRS had a UAAL in excess of \$19.7 billion. Stated differently, the market value of the VRS’s assets was 78.1% of its UAAL on that date. The 78.1% funding ratio represented a significant increase from the low of 60.1% on June 30, 2009, and a 4.7% increase from June 30, 2017. Now is not the time to declare victory, as a significant gap remains between assets and liabilities.

Things also could have been much worse. According to the Pew Charitable Trusts’ most recent report on state pension funds,⁹ states reported \$4.1 trillion in liabilities and \$2.9 trillion in assets in 2017. On average, states had only 69% of the assets needed to fully fund their pension obligations. Kentucky’s funding level was only 34% in 2017, and four other states (Colorado, California, Illinois and New Jersey) were below 50%. Only eight states had sufficient assets to cover 90% of their obligations, while 24 states were below 70% funding.

The VRS has not always been actuarially underfunded. From 2000 to 2002, it possessed assets that exceeded 100% of its estimated future actuarial financial obligations. Several developments altered this. First, the rates of return earned by the VRS fell. The 16-month meltdown

⁷ National Association of State Retirement Administrators, “Public Pension Plan Investment Return Assumptions” (February 2018), [www.nasra.org/files/Issue Briefs/NASRAInvReturnAssumptBrief.pdf](http://www.nasra.org/files/Issue%20Briefs/NASRAInvReturnAssumptBrief.pdf), and the Virginia Retirement System, “VRS Stress Test and Sensitivity Analysis” (June 2017).

⁸ Centers for Disease Control and Prevention, 2018.

⁹ <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2019/06/the-state-pension-funding-gap-2017>.

in equity prices that began in October 2007 played a significant role.¹⁰ Second, the VRS reduced its rate of discount two times during the succeeding decade (a point we discuss below), and this amplified its estimated future obligations. Third, enhanced benefits increased the VRS's obligations. Fourth, the Commonwealth failed to contribute the VRS board's actuarially determined contributions.

This final point is important. From 1993 to 2018, the General Assembly fully funded its own agreed-upon, legally required pension contributions to statewide retirement systems only six times (2001, 2005, 2006, 2016, 2017 and 2018). In 2003, the General Assembly made no contribution at all. From 1992 to 2016, the average level of annual funding compared to the amount required by statute during this period was 72%.¹¹ The modicum of good news is that the General Assembly fully funded its contributions in the most recent three years and is poised to do so again in 2019. Weakening economic growth and, consequently, state revenues, may place this streak in jeopardy in the near future.

The VRS reports that if the Commonwealth had made the contributions required of it by statute, then the VRS now would have almost 90% of its estimated future actuarial financial obligations rather than the current 79%.¹² This is a major reason why the gap between the market value of VRS assets and its actuarial accrued liability expanded (as one can see in Graph 2) during and after the Great Recession. The pension fund reforms begun by the General Assembly in 2010, plus more favorable investment results, have begun to redress this situation.

Nationally, there is broad agreement that state expenditures on Medicaid and pensions have crowded out expenditures on other items, such as education and transportation. The Wall Street Journal reported in 2018 that the proportion of state and local tax revenues devoted to Medicaid and public-sector pensions was the highest in almost 60 years.

Two-thirds of all additional revenues went to fund Medicaid and pensions between 2008 and 2016. In 2016, city and state governments spent about \$105 billion on public employee pensions, dramatically up from about \$29 billion in 2001.¹³

Increasing pension liabilities and funding gaps not only command a greater share of public resources (when states are faced with a pension crisis), but also time and attention. Facing significant funding gaps, pension contributions increased 424% in Illinois, 267% in Kentucky and more than 100% in New Jersey from 2007 to 2017.¹⁴ Even with these increases, pension funding gaps continued to increase in each of these states.

The General Assembly recognized this possibility and related public employee pension issues when it created the Virginia Commission on Employee Retirement Security and Pension Reform in 2016. The commission has issued several recommendations consistent with the analysis presented in this chapter. The new commission also recommended legislation that would codify existing VRS practice to perform and publish the results of stress tests that assess the system's financial viability under a variety of economic scenarios. These reports were released in June 2017 and December 2018.¹⁵ Thus, it is fair to say that neither the General Assembly nor the VRS has been ignoring the challenges in front of them. What is needed now is additional action.

¹⁰ The S&P 500 Index fell from 1,516.80 on Oct. 12, 2007, to 735.09 on Feb. 13, 2009.

¹¹ Virginia Retirement System, "VRS Stress Test and Sensitivity Analysis" (June 2017).

¹² This statement was included in a communication from the VRS to Old Dominion University's Dragas Center for Economic Analysis and Policy, dated July 6, 2018.

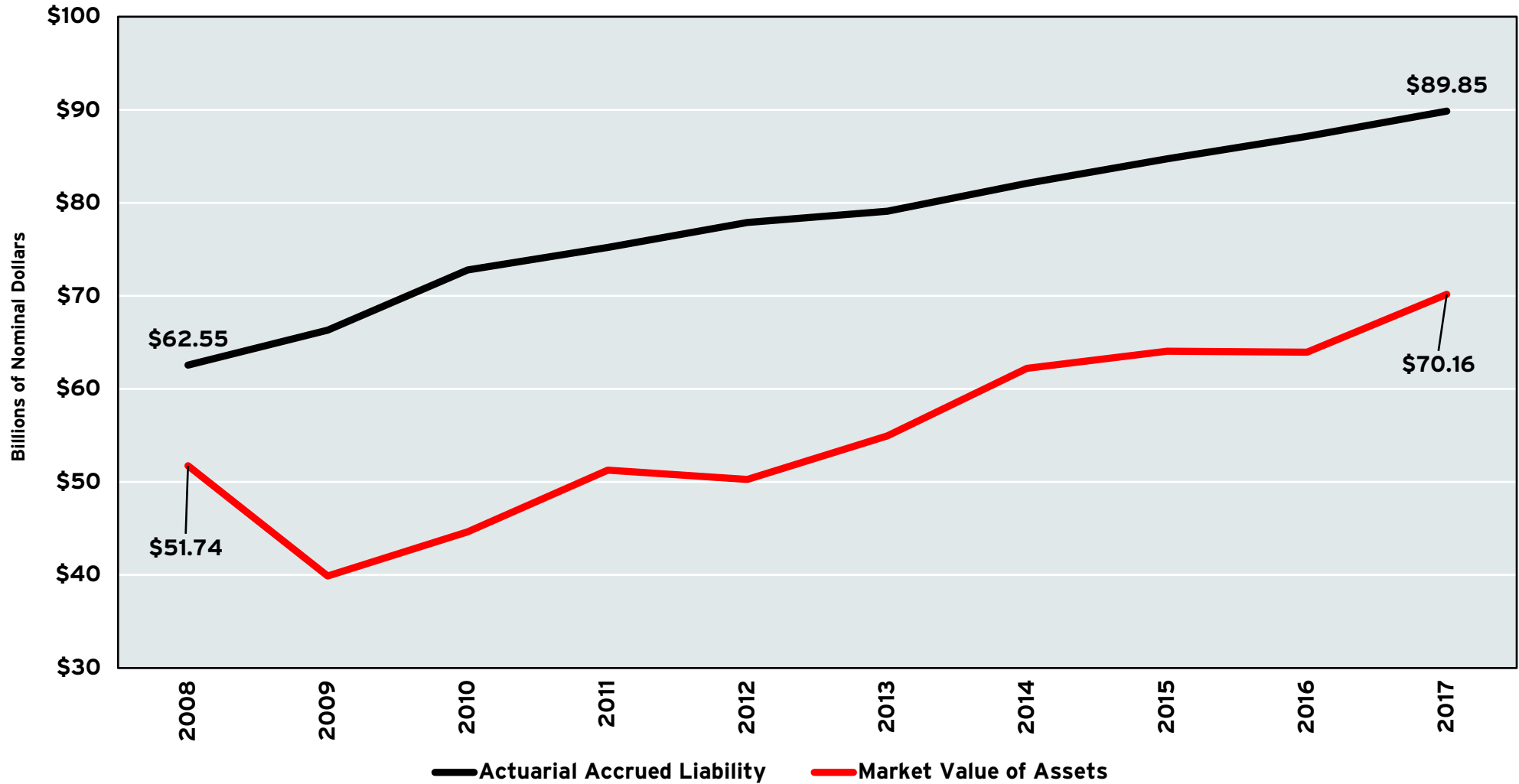
¹³ Cezary Podkul and Heather Gillers, "Why Are States So Strapped for Cash? There Are Two Big Reasons," *The Wall Street Journal* (March 29, 2018), www.wsj.com/articles/why-are-states-so-strapped-for-cash-there-are-two-big-reasons-1522255521.

¹⁴ Pew Charitable Trusts, "The State Pension Funding Gap 2017," June 27, 2019.

¹⁵ Virginia Retirement System, "VRS Stress Test and Sensitivity Analysis" (December 2018), <https://www.varetire.org/Pdf/Publications/VRS-Stress-Test-and-Sensitivity-Analysis-2018.pdf>.

GRAPH 2

**MARKET VALUE OF SYSTEM ASSETS AND ACTUARIAL ACCRUED LIABILITY IN BILLIONS OF DOLLARS:
VIRGINIA RETIREMENT SYSTEM, 2008-2017**



Source: Virginia Retirement System, Comprehensive Financial Annual Report, 2018, p. 267. Actuarial valuation date is June 30 of each year.

Evaluating The Performance Of The VRS

Public pension funds exist for a variety of reasons, some of which are not strictly economic. Management guru Peter Drucker is one of many who have argued that pension contributions by employers instill a sense of belonging in employees and increase their morale.¹⁶ Improved morale may increase employee productivity, lower turnover and, ultimately, improve the bottom line.

It is well beyond the scope of this chapter to examine the morale of participants in the VRS. Instead, in evaluating VRS performance, we will focus on three variables: (1) the rates of return earned by the VRS on the funds entrusted to it; (2) the variability of those rates of return; and (3) the cost expended in achieving its performance. In a nutshell, we will ask: What is the average rate of return earned by the VRS, how variable has been that return and what has been the cost of achieving such?

One should understand that tradeoffs nearly always exist among the three criteria. Usually, it is not possible to increase rates of return on investable funds without also assuming additional risk. The other side of this coin is that it is very difficult to reduce investment risk without also sacrificing some return. Further, some investment strategies are more expensive to implement than others. Complicating this relationship is that one may not necessarily buy improved performance by paying skilled investment advisers to provide advice and counsel.

It is vital to recognize that an infinite number of return/risk/cost combinations exist. No single one of these combinations can be said to be absolutely “right” unless one has clearly identified preferences with respect to risk and return. For example, is it better to realize an average rate of return of 9% that is highly variable, or a 7% average rate of return that is quite stable?

Some pension fund choices effectively are predetermined. Suppose a public pension fund must earn at least a certain rate of return, say 7%. From the

outset, this eliminates a set of conservative investment options. Stability of the returns earned on invested funds might also be an important criterion. It may be unacceptable for a pension fund to realize an average rate of return of 7% over a 10-year period via boom or bust strategies that generate 20.0+% rates of return in some years, but -5% rates of return in other years.

VRS management and its board of trustees ultimately choose (perhaps implicitly) a desired return/risk/cost combination. Presumably, this choice reflects the VRS’s evaluation of accumulated past economic history as well as its estimates of future developments. Of course, subsequent economic fluctuations may result in the VRS, or any pension fund, experiencing a return/risk/cost combination very different from the one it selected.

Retrospectively, however, one can evaluate the results of any investment strategy and stack it up against known alternatives. Hindsight continues to be wonderful. On occasion, one might discover that identical results (say, a 7% certain rate of return) could have been obtained with less volatility than actually experienced, or perhaps achieved at a lower cost. This knowledge might inform a different set of choices in the future, though not necessarily. Consider the significant decline in public equity prices that occurred from 2007 to 2009, or the run-up in public equity prices that occurred subsequently. These were wrenching, but not necessarily unusual events. Making future investment decisions based on spells such as these could lead to less than optimal decisions if the same circumstances aren’t duplicated in the future.

After-the-fact analyses of what the VRS or any investor should have done – had they known what was going to happen – are revealing, but not necessarily definitive, or always subjectively fair. Decision makers must act when required to do so and face uncertainty when they choose their course of action. On the other hand, if one focuses on choices that might have been made, and these alternatives consistently are superior to the choices made, then this dissonance is worthy of attention.

¹⁶ His views are expressed in “Manage with Courage,” the Drucker Institute (Sept. 28, 2018), www.drucker.institute/news-post/manage-with-courage.

We argue that the tendency of the VRS to downplay the superior rates of return and lower costs of many index funds over the past 10 to 25 years is a prime example. The VRS argues that the period 2008-2018 featured unusual economic conditions. Additionally, the VRS points out that the performance of the indexed public equity funds often has been more volatile than that of the total VRS portfolio. These points are legitimate, yet questions remain. Were the costs of actively managed funds offset by improved returns and increased stability or did the VRS pay too much for too little return relative to index funds?



The Assumed Rate Of Return

How does the VRS know how well its asset portfolio will perform in the future and will this be enough for the VRS to meet its obligations? The answer is, it doesn't, but neither does any other pension fund. The world is full of uncertainties. We could witness a stock market crash like the 22.61% single-day decline in the Dow Jones Industrial Average in 1987, or once again experience 17% average mortgage rates as we did in 1981.

The VRS does not know what is going to happen in the future and therefore must make astute, educated assumptions about how asset markets are going to behave. Prior to 2010, the VRS assumed it would average a 7.5% rate of return. Until October 2019, the VRS assumed its assets portfolio would average a 7% rate of return. However, the VRS board recently approved lowering a reduction in its assumed rate of return to 6.75%. This action is conditional on approval of the General Assembly and the governor in 2020.¹⁷

The 7% rate of return assumption may have been too generous. True, since 1900, the average total rate of return (assuming reinvested dividends) on the equities in the Dow Jones Industrial Average has been approximately 9.4% (about 4.8% in price appreciation and 4.6% from reinvested dividends). A problem is that this growth has been uneven. The 1965 closing value of the Dow Jones Industrial Average was 969; it was not until 1982 that this value was permanently eclipsed. Between 1929 and 2017, the Dow Jones Industrial Average declined in 21 of these 88 years.¹⁸

The obligations of public pension funds, however, do not diminish or end because the stock market has tanked. Consequently, pension funds such as the VRS must diversify their asset holdings so they can have greater confidence that their assets will generate income even if the stock market is in agony. Historically, this usually meant using some funds to invest in U.S. government bonds. Assets such as U.S. government bonds are almost universally regarded as among the most secure investments in the world. Risk of default is extremely low.

¹⁷ Michael Martz, "Virginia pension contribution rates likely to rise as investment returns decline," Richmond Times-Dispatch, Oct. 18, 2019.

¹⁸ See "Observations," <http://observationsandnotes.blogspot.com/2009/03/average-annual-stock-market-return.html>, for Dow Jones Industrial Average rates of return data.

A problem is that bond yields typically reside well below the rates of return on investments in equities. Since 10-year U.S. government bond yields peaked at 16.81% in September 1981, they generally have declined since, and in late summer 2019, the yield on 10-year U.S. government bonds hovered around 1.5%.¹⁹ Hence, if one desires safety and security, this need can be satisfied, but usually one must settle for lower rates of return.

Graph 3 provides annual average yields on 10-year U.S. government bonds over the past 30 years. The vertical distance between these yields and the 7% VRS rate of return assumption visually depicts the nature of the challenging task confronting the VRS. This challenge is only slightly reduced if the VRS's assumed rate of return is lowered to 6.75%. Faced with a long-term decline in yields for U.S. government bonds, the VRS must find ways to generate more significant returns. It does so by assuming risk, albeit knowledgeably and after due consideration.

Ultimately, the rates of return earned on investments reflect the sum of the real rate of return on capital (for which we will use the 10-year U.S. government bond as a proxy) plus a risk premium on the collections of assets in which one invests. Larry Summers, the former chair of the President's Council of Economic Advisors and former president of Harvard University, notes that real yields on inflation-adjusted 10-year U.S. government bonds have declined about 300 basis points over the past 10 years. He argues that investors (including pension funds) who believe they can earn 7% on a consistent basis are deluded. He opines that expected rate of return assumptions made by pension systems should be substantially lower today than they have been in the past; that is, lower than 7%.²⁰ The recent declines in U.S. government bond yields only magnify this conclusion.

In 2019, a growing consensus emerged in Virginia that the VRS's assumed rate of return of 7% was a "bridge too far," echoing, to some extent, the conclusion of Professor Summers. The VRS's auditing firm, GRS Retirement Consulting, and Commonwealth Secretary of Finance

Aubrey Layne noted the need to examine whether the VRS should lower its assumed rate of return.²¹ The adoption of the 6.75% rate of return by the VRS board in October 2019 was another step in this direction. Given that a lower assumed rate of return will require additional contributions from the Commonwealth's budget, we now await action by the General Assembly and Gov. Ralph Northam.



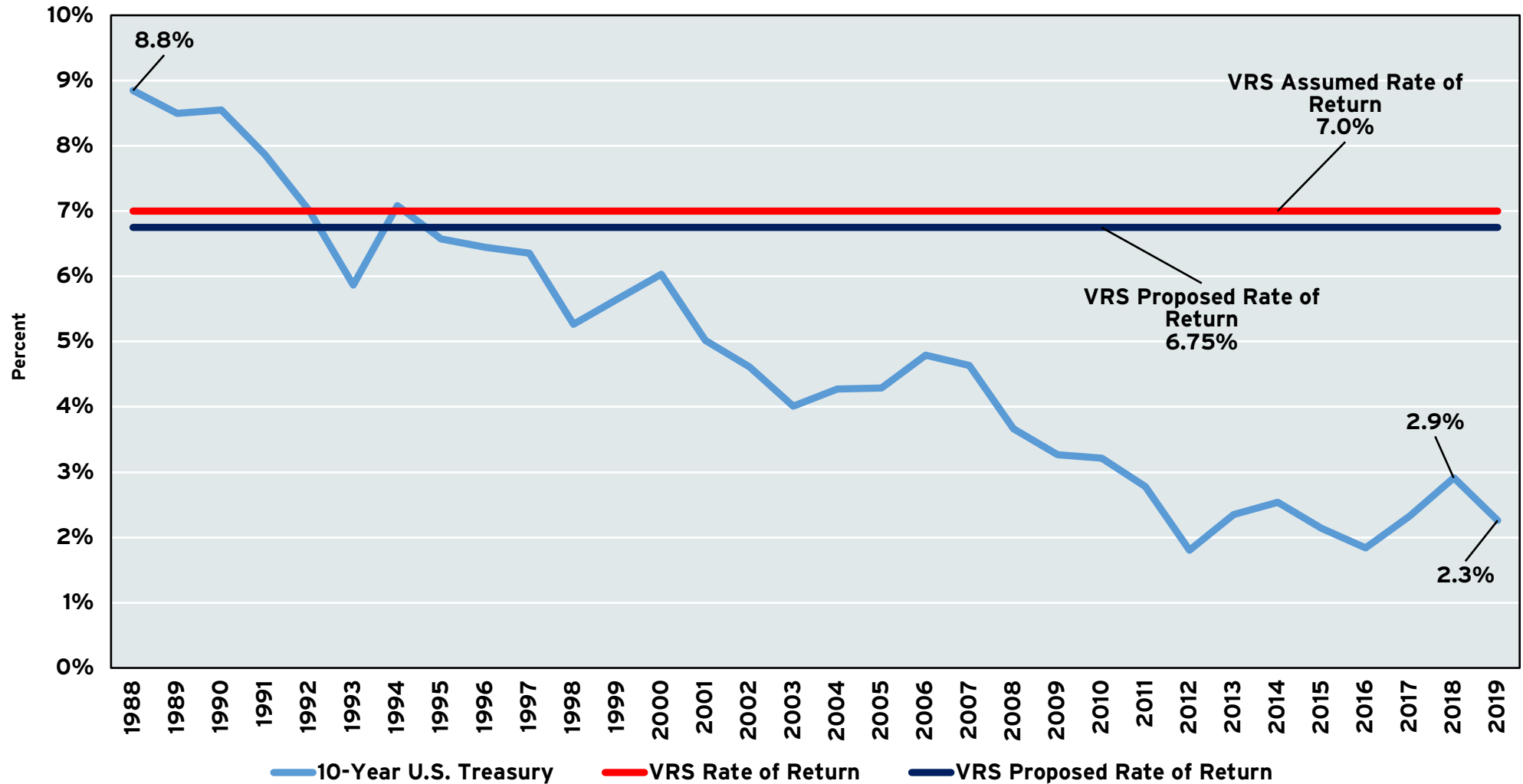
¹⁹ "Daily Treasury Yield Curve Rates," www.treasury.gov/resource-center/data-chart-center/interest-rates/pages/textview.aspx?data=yield.

²⁰ Summers made these observations at a National Bureau of Economic Research Conference, "New Developments in Long-Term Asset Management," held in Cambridge, Massachusetts, May 19-20, 2018. His specific comments can be found at <https://vimeo.com/270659949>.

²¹ Steven Haner, "State Employees Not Funding Their Own Retirement," *Bacon's Rebellion* (July 9, 2018), <https://baconsrebellion.com/state-employees-not-funding-own-retirement>. Michael Martz, "Virginia Retirement System Hits 7 Percent Investment Target for Year, But Target Could Change," *Richmond Times-Dispatch* (July 9, 2018), www.richmond.com/news/virginia/government-politics/virginia-retirement-system-hits-percent-investment-target-for-year-but/article_e4599466-d4ba-5fe3-830b-e419d3f1c58b.html. Michael Martz, "VRS Raises Investment Return to 7.5 Percent for Last Fiscal Year, Beating Recent Estimate But Still Falling Short of Its Goal," *Richmond Times-Dispatch* (Aug. 29, 2018), www.richmond.com/news/virginia/government-politics/general-assembly/vrs-raises-investment-return-to-percent-for-last-fiscal-year/article_95f05aa9-37a7-5bbb-82c9-7fdc22ef2858.html.

GRAPH 3

**TEN-YEAR CONSTANT U.S. TREASURY CONSTANT MATURITY RATES:
ANNUAL AVERAGES, 1988-2019***



Source: Federal Reserve Bank of St. Louis (FRED), DGS10. *For 2019, the 10-year U.S. Treasury constant maturity rate is the average of the rate of the monthly rate data through August 2019.

The Actual Rates Of Return

How well has the VRS performed in terms of the rates of return it has earned on its assets? The answer depends on whom one asks and how one asks the question. The VRS provides different data and metrics over dissimilar time periods than some external authorities, such as the Pew Charitable Trusts, whose recent studies of state pension funds have captured much attention. Further, one must be careful to differentiate between the rates of return earned by the VRS on its public equity portfolio and those earned on its entire portfolio of assets, which include investments in other types of assets.

In a July 6, 2018, communication to Old Dominion University’s Dragas Center for Economic Analysis and Policy, the VRS criticized the Pew Trust’s choice of a 2006 to 2015 period as “cherry picking” and in face-to-face sessions contended that 15- to 25-year time horizons are more appropriate. VRS argues “apples and oranges” with respect to Pew’s data and says Pew defines its rates of return differently than does the VRS. Regardless, if Larry Summers is on target and the United States has entered a period when interest rates and rates of return are going to remain below previously accustomed levels, then the rates of return the VRS likely can earn will decline.

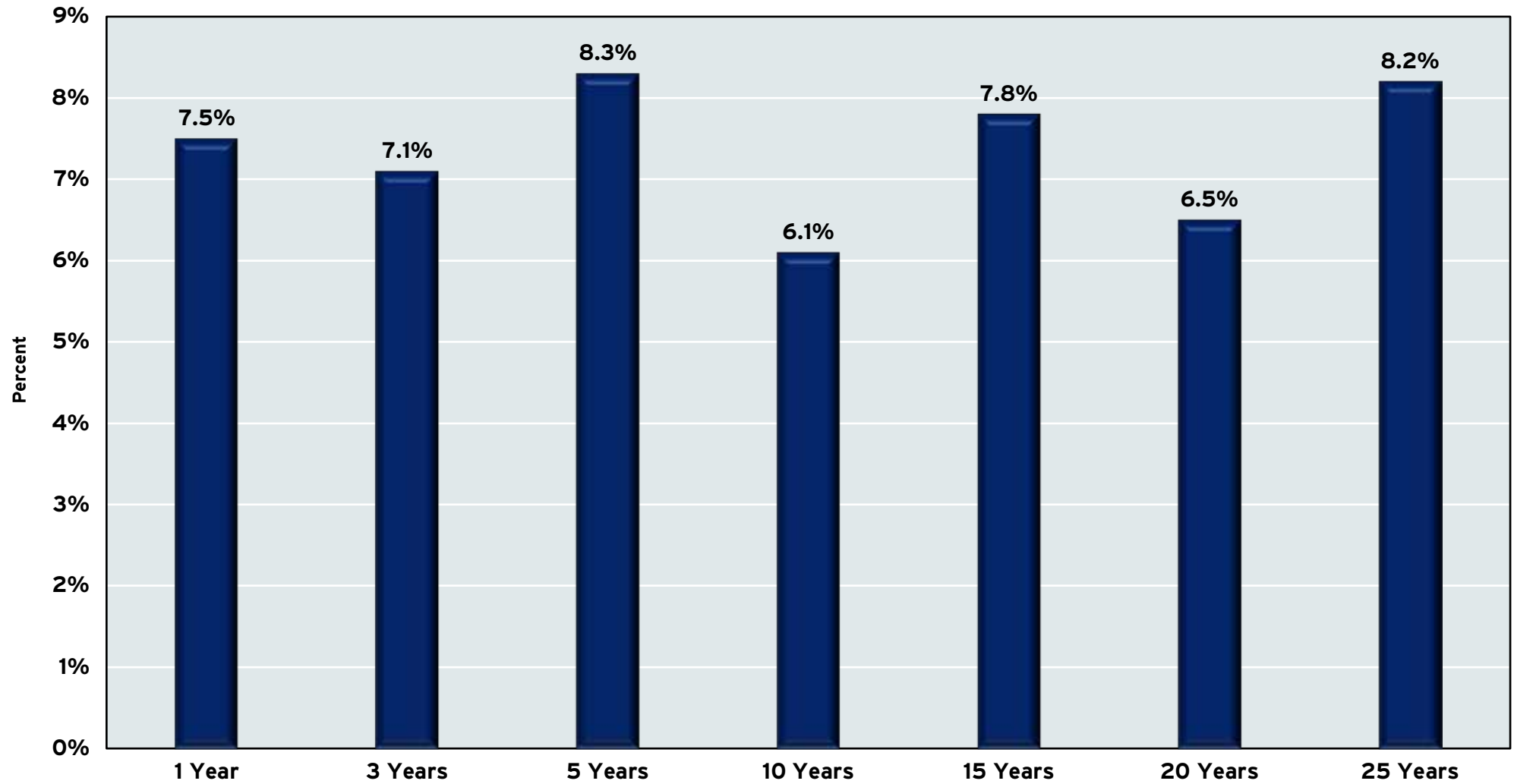
Graph 4 shows annualized rates of return reported by the VRS on its total assets over a variety of time periods ending on June 30, 2018. These data tell us that the VRS often has earned more than the 7% it assumes, but also that the last decade was a trying one. The VRS Oversight Report dated December 2017 revealed that the VRS earned an average rate of return of only 4.9% on its asset portfolio for the 10-year period ending Sept. 30, 2017.²²



²² Joint Legislative Audit and Review Commission, *VRS Oversight Report* (December 2017), p. 2, file:///H:/State%20of%20the%20Commonwealth%202018/Pensions/JLARC%20Report%20on%20VRS%20Dec%202017.pdf.

GRAPH 4

**ANNUALIZED RATES OF RETURN EARNED BY THE VRS
ON ITS ASSET PORTFOLIO FOR PERIODS ENDING JUNE 30, 2018**



Source: Virginia Retirement System, Comprehensive Annual Financial Report, 2018, p. 134

The Pew Charitable Trusts, focusing on a different period (2006-2015), and perhaps utilizing different definitions, placed the VRS firmly in the middle of a 73-pension fund sample with an average rate of return that rose to 5.9%. Pew also provides information that allows us to compare the performance of the VRS with respect to other public pension funds over one-year, five-year and 10-year rates of return periods. Graph 5 displays these data, which include a 6.66% rate of return for the VRS between 2006 and 2015 as compared to a 6.6% average rate of return for 73 public-sector funds.

On Sept. 8, 2019, the VRS announced that it had realized a 6.7% rate of return for FY 2019. The private equity investment program had an annual return of 14%, followed by fixed income at 8.3% and real assets at 7.8%. The public equity program, however, only returned 3.9% and the multi-asset public strategies program lagged with a return of 2.2%. The VRS reported that the trust fund ended with approximately \$82.3 billion in assets.²³

The VRS's rate of return performance improves if one adopts a 25-year time horizon rather than the 10-year vantage seen in Graph 5. As noted, many at the VRS believe (and we concur) that the past 10 years have been atypical and that this helps explain the underwhelming 6.1% rate of return for the 10-year period ending June 30, 2018.²⁴ VRS professionals believe that the unprecedented, almost decade-long period of monetary easing witnessed in the United States after the Great Recession constitutes a financial aberration. They contend that quantitative easing favored public equity market performance and do not think that a similar investment environment is likely to reoccur in the foreseeable future. This is one reason why VRS personnel prefer to evaluate their performance looking backward for 25 years rather than adopting a 10- or 15-year perspective. However, the VRS's annual reports continue to stress 10-year rates of

return on its investments (see, for example, the investment section of the VRS 2018 annual report). If 25-year rates of return are the coin of the realm, then they should be given greater visibility in the VRS reports.

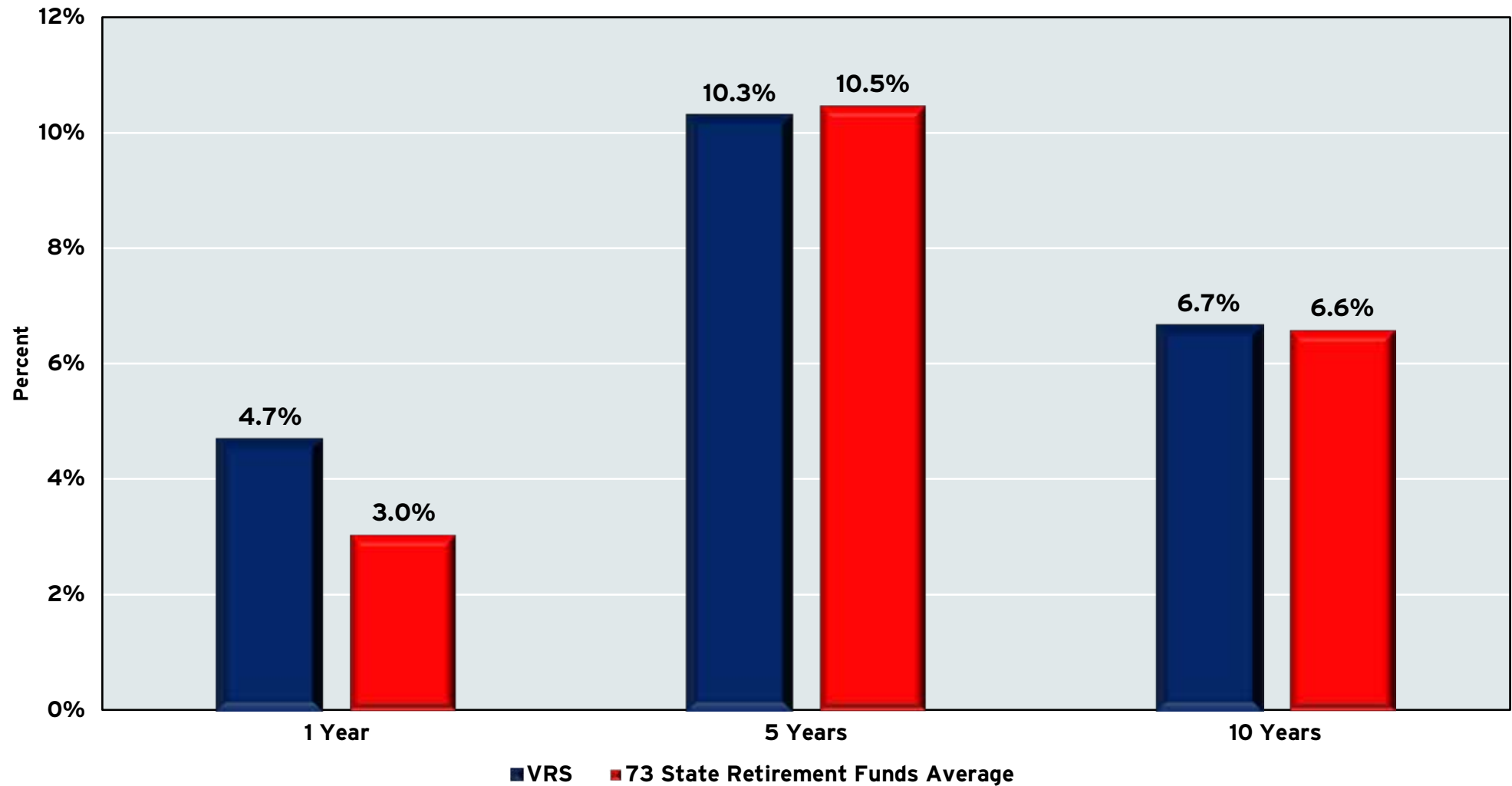


²³ Virginia Retirement System, "VRS Realizes 6.7% Return for Fiscal Year 2019," <https://www.varetire.org/news/2019/vrs-realizes-6.7-percent-return-for-fiscal-year-2019.asp>.

²⁴ Virginia Retirement System, Comprehensive Financial Report, 2018, p. 134.

GRAPH 5

VRS ANNUALIZED RATES OF RETURN: PEW CHARITABLE TRUSTS ESTIMATES, 2006-2015



Source: Pew Charitable Trusts, "State Public Pension Funds Increase Use of Complex Investments" (April 2017). Note that the 73-state average is not weighted by asset size.

How Has The VRS Fared Compared To The Overall Market?

Let's adopt a 25-year time horizon. Consider the adjusted price per share of a specific no-load, low-cost mutual fund that imitates the entire U.S. public equity market. Vanguard's Total Stock Market Index Fund (VTSMX) grew at an annual average rate of 9.29% between June 1992 and June 2017.²⁵ Vanguard reports that the annual cost of VTSMX was 0.14%, thus the net cost annual average rate of return was 9.15%. Determining the net cost return of the stock market index allows a comparison with VRS's public equity portfolio.

Table 1 compares the performance of Vanguard's Total Stock Market Index Fund with VRS's Public Equity portfolio from June 1992 to June 2017.²⁶ Over this period, the annual rate of return of VRS's public equity portfolio was 8.56%, approximately 0.59% less than Vanguard's Total Stock Market Index Fund. One could argue that this is not an equal comparison since VRS's public equity portfolio holds non-U.S. equity assets, thus we caveat that our comparison approximates differences in rates of return.

Nevertheless, as illustrated in Table 1, Vanguard's Total Stock Market Index Fund outperformed VRS's public equity portfolio over every reported time period from 1992 to 2017. Recent data reinforce this observation, as Vanguard's Index rose 14.7%, compared to 9.7% for the VRS public equity portfolio from June 2017 to June 2018. These differences are not trivial.

From 1992 to 2017, the average holdings of VRS's public equity investments were approximately \$23.1 billion and we estimate the

foregone rate average annual rate of return was 0.59% after taking into account expenses.²⁷ The VRS may have foregone \$3.4 billion in returns by not indexing its public equity investments. We must, however, note that this estimate varies significantly year to year. We also must recognize that a stock market index fund may be more volatile than the VRS would prefer and that there is a recognizable tradeoff between risk and reward.

We provide some risk-adjusted analysis in Table 2. The VRS has graciously provided us data for a 25-year period, but we must point out that this period ends in 2017. The more volatile nature of VTSMX returns mitigates some of the differential, but this sum remains a steep price to pay for presumed risk aversion because the risk-adjusted rates of return on VRS public equity and VTSMX are almost identical. Since approximately one-third of all VRS assets are invested in public equity (and about 80% of this in domestic stocks), the VTSMX (or a similar) index seems an appropriate opportunity cost metric against which the VRS should be measured.

Some might view hedge funds as an alternate way for the VRS to generate enhanced returns. However, indexed public equity funds such as those offered by Fidelity and Vanguard have outperformed all but a few actively managed hedge funds, not just over the past decade, but now over the past 15 years, including a half decade when monetary easing was not present.²⁸ Further, this performance differential has held true with respect to many kinds of hedge funds: small cap, mid cap and large cap. This diminishes the attractiveness of hedge funds.

Some VRS personnel assert that over long periods of time, the cumulative return on its assets has been higher than a passively invested 70% equities/30% bonds mix, or the S&P 500 or the MSCI ACWI Investable Market Index (which captures global equity investments).²⁹ Table 2 explores this contention based on available data.

²⁵ The adjusted price per share is from the last business day of June of the respective years. We calculate the compound annual growth rate to obtain the average annual rate of return.

²⁶ We choose this time period to maintain consistency with the annual performance data provided graciously by the VRS for the Total Fund and Public Equity portfolio.

²⁷ Virginia Retirement System, Comprehensive Financial Reports, Investment Section, Various Years. This is a rough calculation based on the VRS having average public equity holdings of \$23.1 billion over the 25-year period. $0.73\% \text{ of } \$23.1 \text{ billion is } \$168.63 \text{ million and } 25 \text{ years} * \$168.63 \text{ million} = \4.22 billion.

²⁸ Mark Perry, "More evidence that it's very hard to 'beat the market' over time, 95% of finance professionals can't do it," *AEI Ideas* (March 20, 2018), <http://www.aei.org/publication/more-evidence-that-its-very-hard-to-beat-the-market-over-time-95-of-financial-professionals-cant-do-it>.

²⁹ The MSCI ACWI Investable Market Index (IMI) says it captures large, mid and small cap representation across developed markets (DM) and emerging markets (EM) countries. With 8,498 constituents, the index is comprehensive, covering approximately 99% of the global equity investment opportunity set, www.msci.com/documents/10199/4211cc4b-453d-4b0a-a6a7-51d36472a703.

TABLE 1**ANNUAL RATES OF RETURN:****VANGUARD'S U.S. STOCK MARKET FUND (VTSMX) AND VRS TOTAL FUND AND PUBLIC EQUITY PERFORMANCE, 1992-2017**

	3 YEARS	5 YEARS	10 YEARS	15 YEARS	20 YEARS	25 YEARS
PERIOD	2014-2017	2012-2017	2007-2017	2002-2017	1997-2017	1992 - 2017
Vanguard VTSMX Return (Gross)	10.20%	14.46%	7.69%	9.34%	6.98%	9.29%
Vanguard VTSMX Return (Net of Fees)	10.06%	14.32%	7.54%	9.20%	6.84%	9.15%
VRS Public Equity Return	6.33%	11.64%	4.54%	7.84%	6.38%	8.56%
Net Difference	3.87%	2.68%	3.0%	1.36%	0.46%	0.59%

Sources: Virginia Retirement System, Comprehensive Financial Report, Various Years, and VRS communication to the Old Dominion University Dragas Center for Economic Analysis and Policy. Annualized returns for periods ending June 30 of the respective years. Daily share price data for VTSMX obtained from Yahoo Finance. The daily adjusted price per share for the last business day of June is used to calculate the compound annual growth rate (CAGR). Vanguard reports an expense ratio of 0.14% and this is deducted from the estimated CAGR to obtain a net of fees rate of return.

TABLE 2**COMPARING RATES OF RETURN, STANDARD DEVIATIONS AND SHARPE RATIOS FOR VARIOUS ASSET GROUPS, 1992-2017**

ASSET GROUP	MEAN ANNUAL RETURN	STANDARD DEVIATION OF RETURN	MODIFIED SHARPE RATIO	VALUE OF \$100 AFTER 25 YEARS
VRS Total Fund	8.34%	8.84%	0.943	\$740.83
VRS Public Equity	8.56%	14.04%	0.610	\$779.37
MSCI ACWI IMI Total World	7.19%	11.20%	0.642	\$567.36
FUSEX S&P 500	9.07%	15.61%	0.581	\$876.26
Passive 70/30	7.65%	10.63%	0.720	\$631.46
VTSMX Total U.S. Market	9.29%	15.07%	0.616	\$921.53

Sources: VRS data are from the VRS, MSCI and FUSEX, and VTSMX data are from Yahoo Finance. MSCI, FUSEX and VTSMX means and standard deviations are computed on the basis of annual averages rather than annualized monthly averages. MSCI data have 0.25% annual expenses deducted, while the comparable deductions are 0.09% for FUSEX, 0.10% for 70/30 and 0.14% for VTSMX.

One can see in Table 2 that the 25-year compound average annual rate of return on the VRS total fund portfolio trailed that of the other asset groups described in Table 2; however, the standard deviation of the VRS's returns over the 25 years was also substantially less than the other asset groups. This means that the returns on VRS's total portfolio were less variable than those earned by the other asset groups. Over the 25-year (1992-2017) period examined, VRS's investment strategies resulted in a substantially higher modified Sharpe Ratio for its total fund than was true for all other asset groups. Sharpe Ratios measure return obtained per unit of risk assumed.³⁰ The data in Table 2 reveal retrospectively that the VRS has done well in terms of generating return per unit of risk in the realm of public equity. **This is long-term evidence that VRS investment policies have avoided excessively risky investments where public equities are concerned. At the same time, the VRS has earned respectable rates of return and maintained liquidity so that it can meet the demands of the day.**

What is a "good" Sharpe Ratio? The answer depends on the time period chosen because opportunities differ significantly in rising markets, as opposed to falling markets. Therefore, one cannot look at the VRS's 0.943 Sharpe Ratio in Table 2 and make many useful historical comparisons. It will suffice to say that the VRS's allocation of its assets performed well per unit of risk it decided to bear during this time period.

These points acknowledged, the VTSMX fund mimicking the entire U.S. stock market rather consistently outperformed the VRS in the public equity area and did so with an almost identical Sharpe Ratio. The major difference between the two is that the VTSMX generated both higher rates of return and higher standard deviations (greater volatility) than did VRS public equity. **Using hindsight, we can say the VRS would have ended up substantially better off at the end of the 25-year period had**

it opted to place significant proportions of its public equity investments in VTSMX or similar fund vehicles. This strategy also would have enabled the VRS to reduce its investment expenses, which totaled more than \$457 million in FY 2018.³¹

We (along with many economists) believe the VRS should index substantially larger proportions of its investments. Reports from former members of the VRS board reveal that the VRS did index most or all its public equity investments between 1994 and 2001. Subsequently, a different composition of board members changed the investment course of the pension fund. All things considered, this was a costly decision – though perhaps understandable. Low-cost, indexed investments seldom have strong appeal to those whose livelihoods depend in whole or part on fee generation.

We understand that investment decisions must be made in an atmosphere of uncertainty. One doesn't know what is going to happen in the future and for this reason we would be surprised if the economic environment in the next 25 years matches what we observed from 1992 to 2017. Knowing this, one should be circumspect in critiquing the investment decisions made by the VRS over the past 25 years. In our view, the VRS made thoughtful decisions even though some of its decision makers may not have been familiar with the full implications of the empirical evidence presented in this chapter. There is room for evolution in this regard.

³⁰ The Sharpe Ratio for asset "i" is $(R_i - C_i)/D_i$, where R is the rate of return on the asset, C is a certainty rate of return such as a Treasury bill, and D is the standard deviation of the return. We omit C_i, a constant across asset classes in a specific time period, from our computations in order to underline the notion of units of return per unit of risk.

³¹ Virginia Retirement System, Popular Annual Financial Report as of June 30, 2018.

A Demanding Assignment: Risk Versus Return

We again note that there does not exist a single “right” combination of return and risk. Some investors accept copious amounts of risk in search of higher returns, while others conscientiously shy away from such scenarios. Conceptually, the VRS is torn between the two. It is currently expected to earn at least 7% on its investments even while it also is expected to maintain liquidity and avoid investments that might impair its ability to meet its long-term obligations and require taxpayer bailouts. Lowering the assumed rate of return to 6.75% will alleviate some of the pressure on the VRS, but, as noted earlier, some economists believe that assumed rates of public pension systems should be substantially lower than 7%.

Other major state pension funds have reached different conclusions than the VRS concerning their ability to outperform the market by means of actively managed funds. The largest public pension fund in the United States, the California Public Employees Retirement System (CalPERS), decided to back away from investments in hedge funds because of high fees and disappointing returns.³² Subsequently, the New York City Employees Retirement System (NYCERS) voted to end its \$1.4 billion investment in hedge funds with the comment that “the funds charge enormous fees for high-risk investments yet yield tepid results.”³³

One must assume that CalPERS and the NYCERS have the ability to hire very talented people to select their investments, yet their hedge funds underperformed as they have in the rest of the world. Clearly, these two well-situated pension systems do not appear to share the VRS’s optimism that they can “beat the market” over the long run in the area of public equities. Partially in defense of its stance, the VRS informed us that only 10.8% of its portfolio was devoted to hedge fund investments in July 2018.³⁴ We believe this percentage should be even smaller.

This brings us to a critical, but unavoidable, question. Should we expect the VRS to outperform public equity market indexes – and to do so with less volatility than the market – over the next decade? And, at the same time, should we expect the VRS to maintain reasonable liquidity?

If these are our expectations, then they present the VRS with a very demanding assignment. Our considered answer to these questions is: “Probably not.” Why not? Very few asset managers (active or not) exhibit the consistent ability to earn higher than average rates of return and do so at lower than average levels of risk. Indeed, portfolio theory suggests this is impossible unless one is lucky, has inside information or possesses a stylized trading advantage such as a superfast computer connection that may provide a millisecond advantage over competitors in the speed of completing trades.

VRS and JLARC data tell us that the VRS did not earn its target 7% rate of return between 2008 and 2018, but neither did most other state pension funds. This stimulated most pension funds nationally to consider investments in collections of assets that they believe will deliver higher expected returns. Included in these asset mixes have been land, businesses, currencies, commodities and options market activities. These portfolios often carry with them additional expected risk even though they deliver diversification.³⁵

We believe it is unreasonable to expect the VRS on a consistent basis to outperform some or all other pension funds, hedge funds in general, or the market as measured by indexes such as the S&P 500 or Vanguard’s VTSMX. While it is entirely reasonable to expect the VRS to “beat the market” in a year or even over several years, the preponderance of evidence is that it is quite difficult to outperform the market in the long term. To assume otherwise is to potentially invite financial peril.

³² Dan Fitzpatrick, “Calpers Pulls Back from Hedge Funds,” *The Wall Street Journal* (July 23, 2014), www.wsj.com/articles/calpers-pulls-back-from-hedge-funds-1406156915.

³³ DC37, ASCME, AFL-CIO, “New York City’s Retirement System Pulls Out of Hedge Funds” (April 14, 2016), <https://dc37blog.wordpress.com/2016/04/14/new-york-citys-retirement-system-pulls-out-of-hedge-funds>.

³⁴ This statistic was contained in an exchange between the Old Dominion University Dragas Center for Economic Analysis and Policy and the VRS in July 2018.

³⁵ This demonstrates that diversification, per se, does not automatically reduce risk. Assets must have negative co-variances in order for them to reduce risk (as measured by volatility) in a portfolio.

The Target Rate Of Return (Rate Of Discount): More

Pension funds must make some assumption about the rate of return they expect to earn on their invested funds in order to assess their financial viability. In 2017, the median assumed rate of return for state pension funds was 7.15%. Yet, from 2006 to 2016, the median rate of return was only 5.8%. The VRS target rate for this period was 7%, but data from the Pew Charitable Trusts suggest that the VRS's actual return was 5.6%.³⁶ During a different 10-year period ending on Sept. 30, 2017, Virginia's Joint Legislative Audit and Review Committee (JLARC) said the VRS earned only 4.9% on its asset portfolio. And, in yet another 10-year period, this one ending March 31, 2018, JLARC reported that the VRS earned a 5.9% rate of return on its invested assets. Another report, dated July 9, 2018, stated that the 5.9% rate of return exceeded the VRS's benchmark return of 5.5% by 0.4%. Finally, the VRS reported a 6.1% rate of return on its total fund for the 10-year period ending June 30, 2018.³⁷

A review of the publicly available data strongly suggests that a 7% rate of return target is overly optimistic. South Dakota, which is considered one of the more stable state pension systems, assumes a rate of return of 6.5%. The recent decision to lower VRS's assumed rate of return to 6.75% will, if approved by the General Assembly and the governor, more closely align VRS's assumptions with performance. However, it would also increase the present value of its future obligations.

One can quibble with the categories and measurement criteria the VRS utilizes to evaluate its performance. The organization usually selects as benchmarks funds or groups of funds rather than indexes of entire markets against which to measure its performance.

The Code of Virginia, Section 51.1-124.30:1, requires the VRS to assess its sensitivity and vulnerabilities to a variety of possible economic scenarios including reductions in its rates of return, changing benefit levels, and so on. Reports of these test results are submitted to the General Assembly, the most recent one dated December 2018. These are complex, though quite valuable, documents because they pose a series of "What if?" scenarios involving both good and bad developments. Among these are negative scenarios that include reductions in the rates of return the VRS earns on its investments, and reduced contributions from the General Assembly. Matters such as the long-term savings that could be realized if more rapid paydown of VRS's unfunded liabilities were undertaken are also given consideration. The most recent report may be accessed at www.varetire.org/Pdf/Publications/VRS-Stress-Test-and-Sensitivity-Analysis-2018.pdf.

³⁶ Pew Charitable Trusts, "State Public Pension Funds Increase Use of Complex Investments" (April 2017).

³⁷ Virginia Retirement System, Comprehensive Annual Financial Report for the Year Ended June 30, 2018.

Since a decisive majority of hedge and actively managed funds have not done as well as the overall public equity market in recent years, the VRS can “beat the funds,” and beat benchmark performance metrics based upon the funds, even though it may not “beat the market” in the form of indexes such as VTSMX. It appears that some of the VRS’s benchmarks are not as demanding as they plausibly should be.

The VRS must array its future obligations and then discount them to find what these mean today (that is, find the “present value” of its anticipated future liabilities). In 2005, the VRS reduced its target rate of return to 7.5%, and then again in 2010 to 7%. Higher target rates of return, when used as a rate of discount, diminish the estimated value of the VRS’s future financial obligations. When it decreased its target rate of return to 7%, this reflected financial reality (the rate of return the VRS could expect to earn), but simultaneously increased the present value of its future financial obligations.

Following the statutory requirement which requires a pay-as-you-go methodology or contributions on a current disbursement basis, the VRS utilizes a lower rate of discount for its Line of Duty Act obligations, which relate to eligible survivors of individuals killed or disabled in the line of duty, or their survivors. In 2017, its liabilities were discounted at a 3.56% rate. However, these obligations account for less than 1% of the overall VRS obligation portfolio.

If state pension funds were held to the same accounting standard as private-sector pension funds, then the Governmental Accounting Standards Board (GASB) says it would use what is termed a “blended rate” of discount that combines a risk-free local or U.S. government bond yield with higher-risk assets such as long-term corporate bonds.³⁸

This could result in a discount rate as low as 4% and, in the case of the VRS, would substantially increase the present value of its future financial obligations. Alicia Mundell, a well-known pension expert at Boston College, and three of her colleagues modeled the impact of lower discount rates on 126 public pension plans using FY 2010 data. She found that even a modest decrease in discount rates would have caused the funds’ funding percentages to fall from 77% of anticipated future financial obligations to only 63%.³⁹ There is consensus among economists that most public-sector pension funds understate their future financial obligations because they discount their future financial liabilities at unrealistically high rates.⁴⁰

The recent VRS board decision to adopt a 6.75% assumed rate of return will more closely align expectations to performance but also increases the present value of the VRS’s future financial obligations. This illustrates the difficult position of VRS management. Unrealistic expectations lower the present value of future financial obligations and commitments from the Commonwealth’s budget, but also increase the risk that the VRS will fall short of the funds needed to meet future obligations. More closely aligning expectations with historical performance is a more prudent course of action and decreases future financial risk. However, lowering the rate of return has the immediate effect of increasing the present value of future obligations, making the VRS appear even more underfunded than it is now, and requires additional contributions from the Commonwealth’s budget.

We applaud the decision of the VRS board to lower the assumed rate of return to 6.75%. Undoubtedly, this decision will precipitate a realistic and lengthy discussion about the viability of the Commonwealth’s pension funds and the nature of the pensions offered to public-sector employees.

³⁸ Sheila Weinberg and Eileen Norcross, “GASB 67 and GASB 68: What the New Accounting Standards Mean for Public Pension Reporting,” Mercatus Center, George Mason University (June 15, 2017), www.mercatus.org/publications/gasb-67-68-public-pension-reporting.

³⁹ Alicia H. Mundell, Jean-Pierre Aubry, Joshua Hurwitz and Laura Quinby, “How Would GASB Proposals Affect State and Local Pension Reporting?” (June 2012), <https://ssrn.com/abstract=2316838>.

⁴⁰ Alicia Mundell et al.

Asset Mix

In order to moderate swings in the value of its asset portfolio, the VRS diversifies its holdings across many different asset classes, including equities, bonds, real estate, commodities and other assets. Like most informed investors, the VRS subscribes to the old maxim, “Don’t put all of your eggs in one basket.” In fact, the mathematics and economics associated with this important advice are complex, and economists Harry Markowitz and James Tobin won Nobel Prizes for providing and explaining it. For example, they clarified the principles illustrating how investors could minimize the risks associated with earning a rate of return such as 7%.⁴¹ Minimizing risk, of course, is not synonymous with eliminating risk.

The salient point to remember is that the higher the average rate of return one hopes to earn, ordinarily the higher the level of risk one must assume. The cost of earning a higher than average rate of return may be increased volatility and likely there would be some years when rates of return are negative. For example, in 2000, 2001 and 2002, the annual rates of return on the stocks in the Standard and Poor’s 500 Index were -9.03%, -11.85% and -21.97%, respectively.⁴²

Such extended declines in value exert great financial pressure on pension funds, which generate about 60% of their benefit payments from the dividends and capital gains produced by their investments. The 37.4% decline in equity values that occurred in 2000-2002 made it very difficult for any investor to generate capital gains and perhaps constitutes an argument in favor of asset diversification.

These uncertainties can be compounded by pension funds’ exposure to fluctuations in foreign exchange rates for investments that may be denominated in currencies such as yen or euros.⁴³ While the American economy accounts for about one-quarter of the value of the world’s economic activity, the most rapidly growing economies are located

elsewhere, and hence some of the world’s prime investment opportunities exist outside of the United States. Such opportunities titillate investors with the promise of higher returns, but often carry with them higher levels of risk.

Given these circumstances, and the uncertainties concerning life spans and the like, what’s a public pension fund portfolio manager to do? He or she needs to generate that 7% rate of return, but even this may turn out to be insufficient if the state fails to make the contributions to the pension fund for which it is obligated.

Graph 6 reports how the VRS was deploying its \$80.4 billion in assets on March 31, 2019. Conventional investments in equities (stocks) and fixed-income instruments such as bonds accounted for 56% of the value of the VRS’s portfolio. What the VRS terms credit strategies accounted for 14% of its portfolio, while real assets claimed 14%, private equity, 11%, and what the VRS labels strategic opportunities, 3%.

The VRS’s asset deployment is not unusual. Most public pension funds have responded to their funding and rate of return challenges by investing their asset portfolios more aggressively. They seek higher rates of return on their investments, but in order to obtain the promise of such, ordinarily they must accept higher risks. Nearly all pension funds (the VRS included) now invest funds in a broad variety of assets. These include actively managed funds that in turn invest in risky collections of assets (often with borrowed funds), private equity firms that are not publicly listed on a stock exchange, real assets such as real estate, and commodities that could range from pork bellies to aluminum. The VRS, however, reports that its commodities investments are minimal.

If a pension fund directs more dollars toward alternative assets, then usually this fund needs to hire more internal talent to conduct this business and also pay more to outsiders such as hedge fund managers, who it is believed have the ability to generate higher rates of return. The March 31, 2018, JLARC assessment of the VRS reported that the VRS

⁴¹ Markowitz and Tobin also showed how investors could maximize the rate of return they earned given whatever level of risk they were willing to tolerate. Harry M. Markowitz, “Portfolio Selection,” *Journal of Finance*, 7 (1952), 77-91. James Tobin, “Liquidity Preference as Behavior Towards Risk,” *Review of Economic Studies*, 25 (1961), 65-86.

⁴² Robert Alan Schwartz, “Annual Returns of the SEP 500 From 1928 to 2015,” *Seeking Alpha*, <https://seekingalpha.com/instablog/605212-robert-allan-schwartz/4831186-annual-returns-s-and-p-500-1928-2015>.

⁴³ Any investor can sell such risks to others (essentially buy an insurance policy) by purchasing options. Most pension funds do so, but similar to insurance policies, there is a cost attached to such behavior. Of course, any investor also can choose to buy these risks as well, and this could result either in gains or losses.

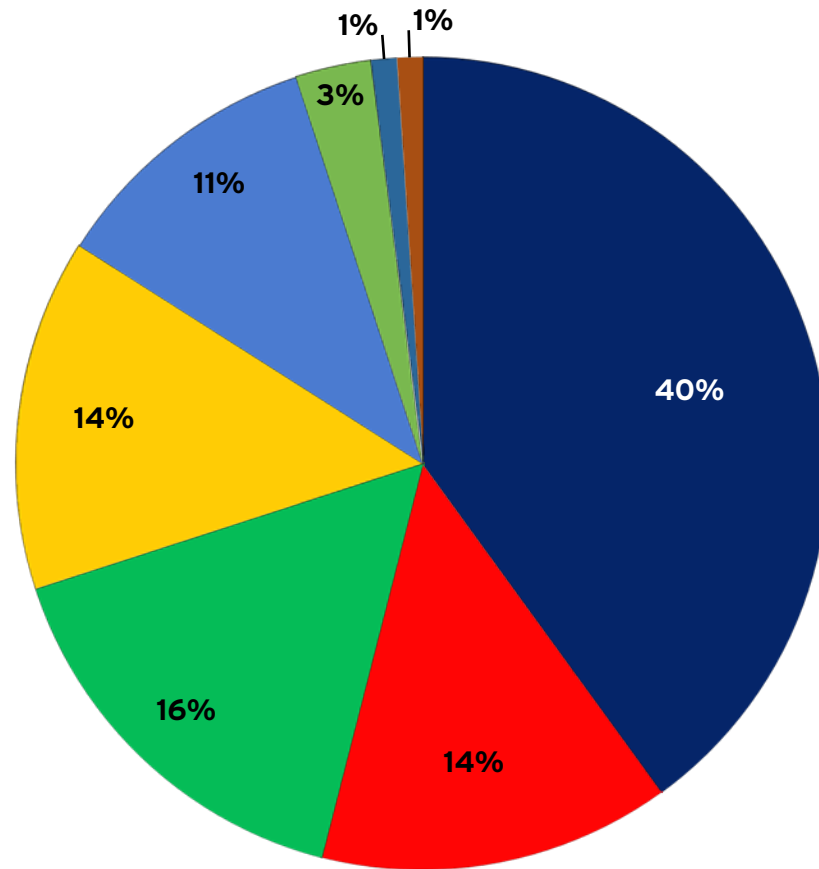
internally manages 100% of its fixed income investments and 40% of its public equity investments, but only 6% of its real asset investments. All other assets are managed by external experts whom the VRS must pay for their services.

In 2016, the Pew Charitable Trusts reported that median state pension plans expended \$70.9 million on expenses to administer the pension system, significantly less than the \$390.9 million in expenses for the VRS. However, this may be misleading, as Virginia has one system while other states have several systems. Taking this potential critique into account, we find that the VRS's total investment expenses were 0.58% of its total investments. These costs were primarily driven by external management

fees. The VRS's external management expenses were 0.52% of its total investments, above the national median of 0.34%. While the VRS's external management expenses are higher than the national median, its performance in this regard is significantly better than some other state pension funds. The Arizona Public Safety Personnel Retirement System, for example, had management fees equal to 2.23% of investment assets in 2016. On the other hand, Utah, which invests 42% of its portfolio in alternative investments (real estate, hedge funds, etc.), only paid external management expenses equal to 0.13% of its total investments. These data suggest that the VRS could lower its external management costs.



GRAPH 6
VRS ASSET ALLOCATION BY CATEGORY,
MARCH 31, 2019



■ Public Equity ■ Credit Strategies ■ Fixed Income ■ Real Assets ■ Private Equity ■ Strategic Opportunities ■ Cash ■ Other

Source: Joint Legislative Audit and Review Commission, VRS Oversight Report (July 2019)

However, we must take care to note that the Pew data conflict with the VRS's and JLARC's assertions that the VRS's investment expenses have been lower than the national average. The VRS has also expressed serious concern about Pew's definitions and its findings. Reasonable people can disagree on these points.

It is not clear precisely how the VRS compensates its external fund managers. An industry standard, however, is "2 and 20," which translates to annual fees that are 2% of all managed assets plus 20% of any profits generated after some minimum hurdle has been met. The New York Times labeled this a "Heads We Win, Tails You Lose" arrangement.⁴⁴ The VRS reported in July 2018 that it kept 80% of returns in excess of an 8% annualized return, with the remaining 20% paid to the external investment managers who generated the return. As of July 2018, these arrangements resulted in the VRS keeping \$21.9 billion in excess returns and \$3.8 billion being paid out to external managers "since inception."⁴⁵

However, a consensus has emerged nationally that "reported fee data are often unreliable and complete fee information is unknown even to the pension fund."⁴⁶ Fee arrangements sometimes are amazingly Byzantine.⁴⁷ Thus, when a recent study of state pension funds by the American Federation of Teachers concluded that 12 large public employee pension funds could have saved \$3.8 billion annually by reducing their reliance upon hedge and actively managed funds, one must treat such data as rough approximations.

There is no disagreement, however, that the VRS's investment management expenses have risen recently (JLARC says 48% between FY 13 and FY 17),⁴⁸ presumably for two reasons. First, the VRS has been investing greater proportions of its funds externally rather than in the public equities and fixed income instruments it manages internally,⁴⁹ and

this results in higher fee payments. Second, rising equity prices during this period may also have resulted in higher fee payments.

An irony attached to this circumstance is that for a decade or more, the typical hedge or actively managed fund consistently has underperformed public equity markets overall. Put differently, a typical investor could have invested in an equity index fund marketed by a well-established provider such as Fidelity or Vanguard, then lapsed into a deep coma, and woken up a decade later to find that he or she consistently had outperformed the actively managed funds. In a typical year, 60% to 80% of hedge and actively managed funds do not perform as well as the S&P 500 average. In 2018, the average hedge fund lost 5.23%, while the S&P 500 fell only 4.38%.

Graph 7 reports similar annual information for the 2009-2018 period. Note the 10-year losing streak of hedge funds versus the S&P 500 Index. From 2002 to 2017, 92.33% of actively managed large cap funds failed to outperform the S&P 500; 94.81% of actively managed mid cap funds failed to outperform the S&P MidCap 400 Index; and 95.73% of actively managed small cap funds failed to outperform the S&P SmallCap 600 Index.⁵⁰ Fidelity, which on March 31, 2018, managed \$2.09 trillion in mutual fund assets,⁵¹ offers its FUSEX 500 Index Fund, which is designed to replicate the equities in the S&P 500. FUSEX returned 9.42% annually over the past 10 years and its expense ratio was a miniscule .09%.⁵² This compares to the VRS's 6.66% annual rate of return over the 2006-2015 period (but 4.9% for the 10 years ending Sept. 30, 2017) and investment expenses of 0.55%. The VRS could have increased its rate of return by 2.76% and reduced its expenses by .46% had it indexed its investments solely in public equities (not a strategy we would recommend for a variety of reasons, but an interesting comparison nonetheless).

44 As reported by the American Federation of Teachers, "The Big Squeeze" (2017), www.aft.org/sites/default/files/bigsqueeze_may2017.pdf.

45 Joint Legislative Audit and Review Commission, VRS Oversight Report (July 2018). It is not clear from the report what time period or periods "since inception" comprises.

46 American Federation of Teachers. Pew agrees.

47 Gretchen Morgenson, "The Deal's Done. But Not the Fees," *The New York Times* (May 24, 2014), www.nytimes.com/2014/05/25/business/the-deals-done-but-not-the-fees.html.

48 Joint Legislative Audit and Review Commission, VRS Oversight Report (December 2017), p. 7, <http://jlarc.virginia.gov/pdfs/reports/Rpt504.pdf>.

49 The supposition of the American Federation of Teachers.

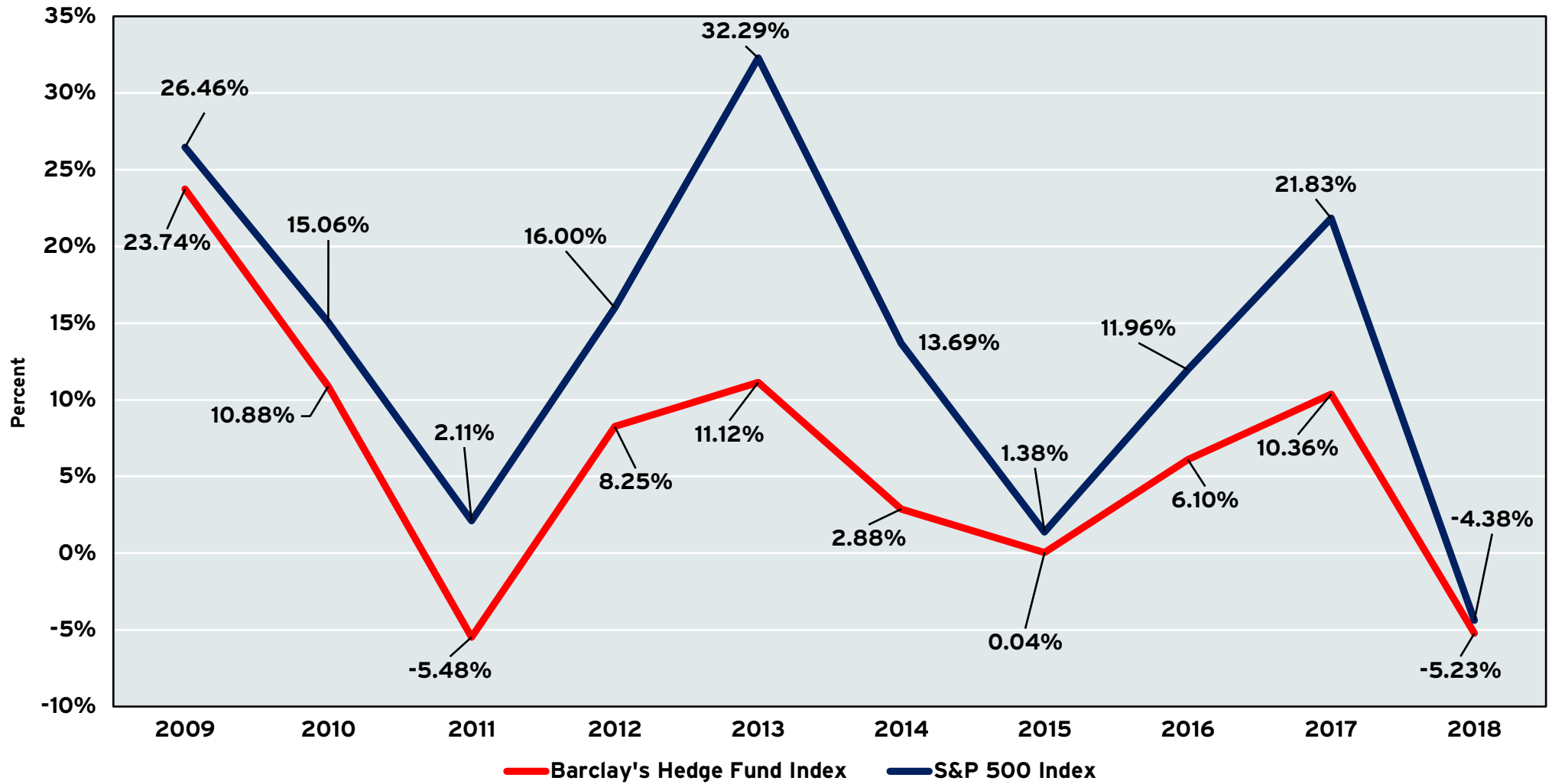
50 Mark Perry, "More evidence that it's very hard to 'beat the market' over time, 95% of finance professionals can't do it," *AEI Ideas* (March 20, 2018), <http://www.aei.org/publication/more-evidence-that-its-very-hard-to-beat-the-market-over-time-95-of-financial-professionals-cant-do-it>.

51 www.fidelity.com/about-fidelity/fidelity-by-numbers/corporate-statistics.

52 Fidelity 500 Index Fund, <https://fundresearch.fidelity.com/mutual-funds/composition/315911206> (accessed April 9, 2018).

GRAPH 7

**BARCLAY HEDGE FUND INDEX VERSUS THE S&P 500 AVERAGE:
ANNUALIZED RATES OF RETURN, 2009-2018**



Sources: Barclay's Hedge Fund Index, www.barclayhedge.com/research/indices/ghs/Hedge_Fund_Index.html, and Ycharts, S&P Annual Total Return, https://ycharts.com/indicators/sandp_500_total_return_annual

The lesson is that most public pension funds have the potential to reduce their expenses if they opt to use indexed public equity funds rather than their own staff or external fund managers. We recognize moving in this direction is anathema to many at the VRS, but the potential savings command attention.

There is an interesting analog to this discussion. University endowments bear some similarity to pension funds in terms of the return vs. risk dilemma, though they can more easily reduce payments to endowment account holders than can pension funds. In recent years, university foundations and endowments have engaged in many of the same investment strategies as pension funds. The results have been less than spectacular. Over the past decade, university endowments returned an average of 4.6% on their investments. This trailed the 5.3% rate of return that a simple 60/40 stock/bond index fund mix would have returned or the 5.4% rate of return that a simple 70/30 stock/bond index fund mix would have returned.⁵³ That is, they could have done better by “indexing” (investing in funds that imitate entire markets or segments of markets rather than investing in specific stocks or bonds, to minimize their trading and offer much lower management costs as one consequence).

Investment professionals who make their living from the fees they earn from actively investing funds on behalf of their clients often supply a blizzard of reasons why their services are valuable, if not irreplaceable. Some of their arguments do resonate. For example, whole market index funds such as those offered by Fidelity and Vanguard⁵⁴ do not contain assets or companies that are new on the scene, or are not publicly traded, and thus one could miss potentially superb opportunities if one only indexes the public firms via a fund such as the FUSEX 500.

Nevertheless, the arguments put forward by active investment professionals can tend to be self-serving. They make their living by convincing the VRS and other pension funds to hire them to manage their portfolios. Each is a master at explaining why they and their approach to investing are different – why they will succeed even while others rather consistently fall short.

Ultimately, evidence should rule the day. Consider that a 10% reduction in annual investment costs for the VRS would translate to savings of approximately \$45 million annually. A 0.1% increase in the rate of return the VRS realizes on its public equity investments similarly would add about \$40 million to its coffers. These are possibilities that should not be ignored.

We do not argue that the VRS should index all its investments, or avoid all higher cost fund managers, though today it is possible to index nearly any significant asset – commodities, real estate, international assets and currencies in addition to equities and bonds. We agree that index investments don’t always outperform actively managed assets and some specific active investment strategies may exploit less well-known asset segments and possible market inefficiencies to outperform indexes. In addition, indexed investments could be more volatile than some actively managed investments. Again, the salient point is that a significant majority of actively managed funds fail to do as well as the market on a consistent basis. Hence, we recommend that the VRS index a larger proportion of its public equity portfolio and that it assess carefully the extent to which indexing might be useful in other asset classes as well.

The VRS responded to this suggestion in a July 6, 2018, email: “Private equity has been great for VRS. Indexing these funds would adversely impact the plan.” We largely agree with this conclusion because data supplied by the VRS indicate that what it labels its “private equity” investments (as opposed to “public equity”) often have generated higher rates of return and exhibited lower variability than VRS’s public equity investments. Sound principles of diversification make some private equity investments a good idea for the VRS. We would insert a caveat, however. The VRS’s private equity investments may involve it investing in funds that purchase public firms, take them private, then disgorge many of their assets and ultimately lead them into bankruptcy. Some label this vulture capitalism,⁵⁵ and decry it, but in recent years it often has been a profitable strategy.

53 A nontechnical rendition of this situation may be found at James B. Steward, “College Endowments Opt for Alternative, and Less Lucrative, Route,” *The New York Times* (Feb. 22, 2018).

54 The VRS commented to us via email that “VRS provides index funds for cheaper than Fidelity because we are doing so with internal staff.” However, these individuals and their activities are not gratis. They have opportunity costs and hence the comparison with Fidelity and Vanguard is not apt.

55 “Vulture Capitalist,” *Investopedia*, www.investopedia.com/terms/vulturecapitalist.asp.

Defined Benefit Versus Defined Contribution Pension Programs

Earlier, we sketched the differences between defined benefit, defined contribution and hybrid public pension programs. Historically, most public employee pension programs have been defined benefit rather than defined contribution in nature.

Many public employees prefer defined benefit programs because such programs guarantee them a specific income for the remainder of their lives. Further, depending on the length of their service and their highest earning years, defined benefit programs may produce very respectable retirement incomes for them, especially if accompanied by cost-of-living escalators that usually are not present in defined contribution programs. Also, depending on how the funds in a defined contribution program are invested, a recipient's income from that program could increase or decrease.

Taxpayers and citizens find the problem with defined benefit retirement obligations is that they frequently become fiscally burdensome. Longer life spans mean that government pension obligations extend well beyond the time periods originally anticipated. Lower interest rates make it more difficult for pension funds to earn respectable rates of return on traditional low-risk assets such as U.S. government bonds. We have seen this has pushed pension funds into adopting riskier investment mixes involving more equities, commodities and real estate in an attempt to generate higher rates of return.

Pension contributions account for increasing proportions of the budgets of state and local government units. States such as Illinois face disastrous fiscal situations, substantially because of their burgeoning public employee pension obligations. California's Gov. Jerry Brown gained attention in early 2018 when he expressed his hope that California courts would rule

that pension benefits promised to state employees could be rolled back by the state. His changing stance on this matter reflected fiscal reality: in FY 2017, California spent double the amount on pensions as it spent in FY 2009.⁵⁶ It is worth noting that from the standpoint of taxpayers, Virginia's plans are more modest than those of California.

The General Assembly has taken positive steps to extend the reach of hybrid retirement programs. Since Jan. 1, 2014, most new state employees, teachers and local employees enroll in a hybrid plan that combines defined benefit and defined contribution features. On March 31, 2018, 24% of the total active VRS membership was participating in a hybrid plan.⁵⁷

A problem here is that 43% of hybrid plan participants do not make contributions other than those required of them.⁵⁸ This means that they forfeit a generous matching contribution offered by the Commonwealth and damage their long-term financial status.

The General Assembly can assist by continuing to mandate policy "nudges." The Commonwealth's hybrid plan currently contains an auto-escalation feature whereby every three years, participants' voluntary contributions are increased by 0.5% if they aren't already contributing the maximum 4%. Those who contribute the 4% match receive a 2.5% contributory match from the Commonwealth. Thus, if they do not choose to contribute 4%, then they are leaving money on the table and diminishing their eventual retirement stipend. If VRS participants who are not contributing the 4% maximum use the internet to log into their VRS accounts, then they are politely informed that they are not serving themselves well and immediately provided with opportunities to increase their contributions so that they can capture the Commonwealth's matching funds.

⁵⁶ Romy Varghese, "California's Brown Raises Prospect of Pension Cuts in Downturn," *Bloomberg* (Jan. 10, 2018), www.bloomberg.com/news/articles/2018-01-10/california-s-brown-raises-prospect-of-pension-cuts-in-downturn.

⁵⁷ Joint Legislative Audit and Review Commission, VRS Oversight Report (July 2018).

⁵⁸ Virginia Retirement System, Popular Annual Financial Report as of June 30, 2018.

The Commonwealth might, however, require more generous contributions from new participants at the start, but permit them to revoke this guidance after several years.⁵⁹ Experience in other states suggests that large proportions of individuals who are so nudged become accustomed to the higher level of contributions and continue them even when they no longer are required to do so. In the long term, nudges stimulate what most authorities regard as optimal economic choices for participants, though they are not choices most participants initially make if they have the freedom to do otherwise.

The Commonwealth's long-term goal should be to move additional classes of employees entirely into defined contribution programs similar to those now available to faculty and to have all other employees enrolled in the hybrid plan. It should walk this path because this constitutes an important step toward guaranteeing that Virginia will avoid the public employee pension problems that have afflicted so many other states.⁶⁰

The experience of the federal government in this regard is instructive. Fiscal stress in the 1980s pushed the U.S. government in the direction of enrolling all new federal workers in Social Security if they were not already participants, diminishing the generosity of its existing defined benefit program, and creating a defined contribution program with matching employer/employee contributions. The now mandatory program has proved to be popular with federal employees and has controlled the expansion of the government's future financial obligations (Gale et al. for Brookings, 2016).

Portability

The lack of portability of state pension funds is an area where the Commonwealth does not treat state employees as well as it should. Excepting those state employees who opt to participate in an alternative pension system such as TIAA-CREF, vested⁶¹ state employees who wish to “cash out” their Virginia retirement account (perhaps because they are moving to a job outside of state government) may receive back their contributions to the VRS plus interest, but not those contributions made by the Commonwealth. This assumes the departing employee has not become separated because of job performance or misconduct.

The alternative is for employees to leave their contributions with the VRS and to have their ultimate pension payment be based upon their current salary, which typically does not turn out to be an attractive choice. VRS credits only 4% of interest to withdrawn employee contributions, even though it assumes it is earning substantially higher rates of return. One well-positioned observer of this arrangement told us, “In a world of increasing labor mobility, such a system is disgraceful.” We agree. The Commonwealth should: (1) allow vested employees who leave state employment to retain the Commonwealth's contributions; and (2) credit those contributions with a rate of return other than 4%, for example, a rate closer to the VRS's long-term rate of return on its investments. If the VRS earns the 7% rate of return it currently assumes, then it still will have earned a surplus on this account that it is not returning to departing employees.

⁵⁹ See Richard Thaler and Cass Sunstein, *Nudge: Improving Decisions about Health, Welfare and Happiness* (New Haven: Yale, 2008).

⁶⁰ Initially, this policy might be more expensive to Virginia than either the current hybrid program or a defined benefit program. In the long term, however, it reduces the Commonwealth's financial liabilities and eliminates the possibility that Virginia in the future might imitate states such as Illinois and Connecticut, then it will have been worthwhile. Numerous states have asserted that “it can't happen here,” only to find that changing economic and political conditions have rendered their predictions null. Pew has reported that the public employee pension plans of the 50 states were underfunded by \$1.4 billion in 2016. Pew Memorial Trusts, “The State Pension Funding Gap: 2016,” www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/04/the-state-pension-funding-gap-2016.

⁶¹ Employees “vest” after five years of service credit.

Summarizing Proposals For Change

We applaud the VRS for being a transparent, generally well-managed operation. Its quality stewardship has enabled Virginia to avoid the unfortunate pension experiences of many other states. Ronald E. Schmitz, VRS's chief investment officer, reported recently that "the VRS investment staff continues to generate good performance" and in general, we agree.

Our measured judgment is that the VRS is an intelligently managed operation that has avoided most of the problems that have afflicted public employee pension systems in other states. An even-handed view of the VRS leads to the conclusion that it deserves higher than average scores for its performance. However, careful, nonpolitical direction and the changes we outline here are needed to guide Virginia's pension funds through the challenges of coming decades. With this in mind, we believe the General Assembly and the VRS should implement the following four changes in public employee pensions.

First, the VRS should index larger proportions of its asset portfolio and especially do so inside its domestic public equity portfolio, where approximately one-third of all its assets reside. The evidence in this area speaks loudly – indexed public equity funds consistently have outperformed most actively managed public equity funds; this has been true for the last 15 years. Further, if we lengthen our time horizon to 25 years, Vanguard's low-cost VTSMX indexed fund reflecting the entire U.S. stock market has generated a higher rate of return than the VRS has within its own public equity sphere and has achieved this with essentially the same Sharpe Ratio. We understand that managers of hedge funds and active investors persistently contend that they are exceptions to accumulated empirical evidence and therefore have the ability to produce both above-average returns and below-average volatility. Even though this might prove true for a certain period, it is unlikely to persist, and hence, following such advice is a bet Virginia would be wise to decline.

Second, the Commonwealth should accelerate the movement of state employees from defined benefit programs into defined contribution and hybrid retirement programs. However, while doing so, the VRS needs to find more effective ways to increase the voluntary contributions that participants make to their personal hybrid programs. Additional statutory "nudges" should be considered. Enhanced participation would benefit VRS members and simultaneously reduce the Commonwealth's future financial risks and exposure. With respect to this latter point, the VRS estimates that the hybrid retirement program would reduce risk to employers within the defined benefit program by about one-third.⁶²

Third, gradually, perhaps over a period as long as 20 years, the VRS should reduce its target rate of return (rate of discount). This would result in larger estimates of the future pension fund financial obligations of the VRS but would be consistent with the way private firms are required to assess their portfolios and estimate their future financial obligations. Because this action would necessitate some combination of larger state and local government pension contributions, larger employee contributions or diminished benefits, it would require extensive conversations with the General Assembly.

Fourth, the Commonwealth should improve the portability of the state employees' VRS accounts. As things stand, vested employees who depart state employment receive only their own contributions (not those of the Commonwealth) plus a 4% rate of interest on their contributions. The alternative for these individuals is to leave their contributions with the VRS, which means that ultimately, they would receive pension payments based on what their salary was when they departed. Ordinarily, this is not an attractive choice. The Commonwealth can and should do better in an era characterized by high levels of employee mobility.

Should the Commonwealth not move in these directions, then the probability increases that it will experience future public pension problems. By no means do we see disaster looming on the horizon; however, very few analysts foresaw the financial implosion of 2008-2009. Considered in this light, our recommendations represent fiscally prudent courses of action.

⁶² Joint Legislative Audit and Review Committee, VRS Overview Report (July 9, 2018), at p. 48, http://jlarc.virginia.gov/pdfs/oversight/VRS/2018_VRS-Pres.pdf.

