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# ESSAY

JULY 2015



## BETTING ON THE BIG RETURNS: HOW MISSOURI TEACHER PENSION PLANS HAVE SHIFTED TO RISKIER ASSETS

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### ABSTRACT

Defined-benefit public employee pensions are increasingly relying on investment returns, rather than employee and employer contributions, to pay for the guaranteed benefits to pensioners. This makes the selection of a plan's investment strategy important. Nationally, public employee pension plans have shifted investments from low-risk, low-return strategies which rely on fixed-income investments to high-risk, high-return strategies which include more equities and alternative investments. This essay

examines the Comprehensive Annual Financial Reports (CAFR) of Missouri's public school teacher pension programs. Using information from each plan's CAFR, we find that the plans have followed the national trend and have increasingly shifted away from fixed-income and cash investments.

### INTRODUCTION

In order to help fund their retirement, Missouri teachers and their employers make contributions to a defined-benefit pension plan. Unlike a 401k or other conventional

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retirement plans, benefits in a defined-benefit pension plan are not tied directly to an individual's contributions. Rather, benefits are guaranteed based on a formula that typically takes into account years of service and the teacher's final average salary. Though member contributions make up a significant portion of the funds used to deliver promised pension payouts, contributions are not the main source of revenue for public pensions. The majority of revenue comes from investments.

According to the National Association of State Retirement Administrators, from 1984 to 2013, investment returns accounted for 62 percent of pension plan revenue.<sup>1</sup> Teachers' pensions in Missouri are similar to pension systems across the country in that they rely heavily on their investment performance to provide revenue. For example, the Public School Retirement System of Missouri (PSRS) received more than \$1.3 billion in employer and employee contributions while it received close to \$5 billion in investment income.<sup>2</sup> In fact, without the income received from investments, total employer and employee contributions would not have been as much as the pension liabilities due to retirees.

Of course all fund managers, whether public or private, want to maximize returns for their clients. However, in defined-benefit public pension systems, retirees are promised a specific payout, while in private retirement plans there is no guarantee that investments will pay off. Accordingly, investors in private

funds can choose their preferred risk/return portfolio strategy. In the public sector, managers must meet expected rates of return. With so much riding on a plan's returns, plan managers have significant motivation to pursue large returns. The Pew Charitable Trusts and the Laura and John Arnold Foundation (Pew Report) examined public pension investments over the past 30 years. The study found public pension systems have gradually shifted assets away from fixed-income investments and toward riskier investments in hopes of obtaining larger returns.<sup>3</sup>

Risk is not an inherently bad thing. Investors who buy riskier assets are typically compensated for the risk they take with higher expected returns.<sup>4</sup> The issue for public pensions is that their liabilities, the promised benefits to their members, are guaranteed. Thus, for all intents and purposes, they are inherently riskless.<sup>5</sup> If a riskier asset fails to generate enough in returns so that a pension plan can pay out promised benefits, the taxpayer could be forced to make up the difference.

The purpose of this paper is to document whether teacher pension systems in Missouri have followed the trend discovered in the Pew Report. Public school teachers in Missouri are in one of three pension plans. PSRS is the largest plan. Combined with the Public Education Employee Retirement System (PEERS) for non-certified staff, the plans serve over 230,000 members and have a market value of invested assets of \$37.9 billion. This makes PSRS/PEERS the

largest public pension in the state of Missouri.<sup>6</sup> The other two public school pension plans are the Public School Retirement System for the City of Saint Louis (PSRSSTL) and the Kansas City Public School Retirement System (KCPSRS).

## ASSET CLASSES

When discussing the investments of these plans, it is important to first define our terms. The Pew Report defined investments into three classes. This paper uses those same definitions when discussing different types of investments.

- **Fixed-income investments** are any investments in which returns are predictable and paid at designated times. These can include domestic or international bonds issued by governments or corporations. Because fixed-income investments guarantee a specified return, these are generally considered lower-risk investments.<sup>7</sup>
- **Equities** are stocks held by investors that represent ownership in a piece of a company. They can be domestic or international. Equities do not guarantee a specific rate of return and thus are generally riskier than fixed-income investments. But equities also have the potential for higher returns, and shareholders' investments may grow rapidly with the market.<sup>8</sup>
- **Alternative investments** are any investments other than the

traditional asset classes (fixed-income, cash, and equities). Alternative investments can be real estate, private equity, commodities, or hedge funds. Alternative investments often have the highest risk, but with the possibility of the highest rate of return.<sup>9</sup>

Historically, equities have had higher returns than fixed-income investments. In 1976, Roger Ibbotson and Rex Sinquefeld performed the first comprehensive study of historical returns for a series of different assets including common stock (equities), long-term government bonds (fixed-income), corporate bonds (fixed-income), and U.S. Treasury bills (fixed-income) from 1926 to 1974.<sup>10</sup> They found that during this period the common stock has larger annual returns than government bonds, corporate bonds, or the treasury bills. Aswath Damodaran lists the annual returns for stocks and treasury bills from 1928 to 2014.<sup>11</sup> The annual return for stocks was 11.53 percent while the annual return for treasury bills was 3.53 percent.

As noted above, these higher returns compensate investors for the risk they take by investing in different assets.<sup>12</sup> A common measure for the risk of an asset is the standard deviation of its returns.<sup>13</sup> Based on the Damodaran data, the variance of stock returns from 1928 to 2014 was 19.79 percent while the standard deviation on treasury bills was 3.04 percent.<sup>14</sup> Hence equities like common stock have greater risk than fixed-income securities, such as treasury bills, and thus investors

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*To examine the investment strategy of PSRS, PEERS, PSRSSTL, and KCPSRS, we obtained CAFRs from each plan from 1992 to 2014.*

need to be compensated by higher returns in order to purchase these assets.

It has been harder to gather information on historical returns and standard deviation for alternative assets. However, Wilshire, an investment consulting firm, has managed to quantify the inherent risk and the expected returns involved in all three asset classes, including alternatives (see Figure 1).<sup>15</sup> As Figure 1 shows, alternative assets are riskier than both equities and fixed-income securities.

Alternatives carry more risk than other asset classes, but they are also expected to generate higher returns than either equities (6.83 percent annual return for alternatives versus 6.25 percent for equities) or fixed income investments (6.83 percent versus 2.50 percent).

### SHIFTING INVESTMENTS TO RISKIER ASSET CLASSES

To examine the investment strategy

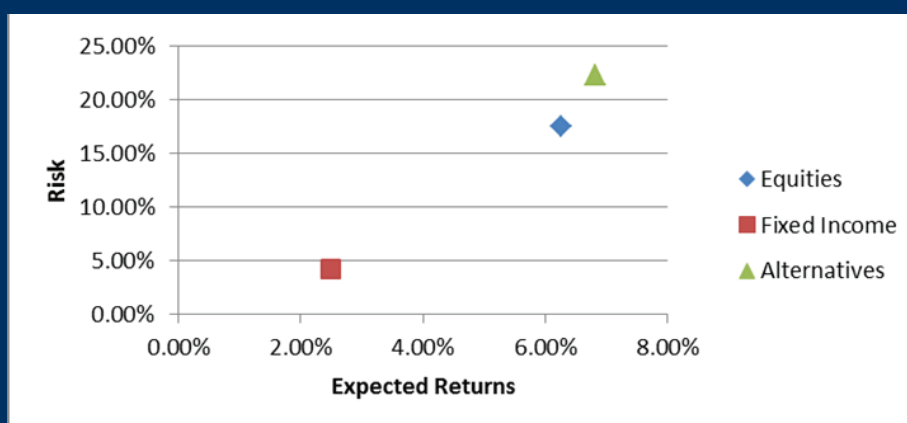
of PSRS, PEERS, PSRSSTL, and KCPSRS, we obtained CAFRs from each plan from 1992 to 2014.<sup>16</sup> Using these reports, we categorized investments into the three asset classes defined previously. It is clear from these documents that over time each of these public employee pension systems has shifted assets to more risky investments (Figures 2, 3, 4, and 5).

In 1992, PSRS had more than 80 percent of its investments in fixed income and cash (Figure 2).<sup>17</sup> By 2014, that figure had dropped to less than 24 percent. Investments in equities and alternatives grew over that same time period. The amount of plan assets invested in equities peaked in 2007 (68 percent) and has since declined to roughly 48 percent of invested assets. The amount of assets invested in alternatives started in 2005 and has continued to grow. As of 2014, they make up roughly 28 percent of the invested assets.

This same shift in asset weighting occurs in PEERS as well. As Figure 3 shows, there has been a decline in the percentage of investments in fixed income and cash, from 85 percent in 1992 to 24 percent in 2014.<sup>18</sup> The investment portfolio of PEERS has shifted away from fixed income and cash and toward equities and alternatives. The percent invested in equities grew from 15 percent in 1992 to 48 percent in 2014. Alternative investments began to be included in the investment portfolio starting in 2005. By 2014, they made up over 28 percent of investments.

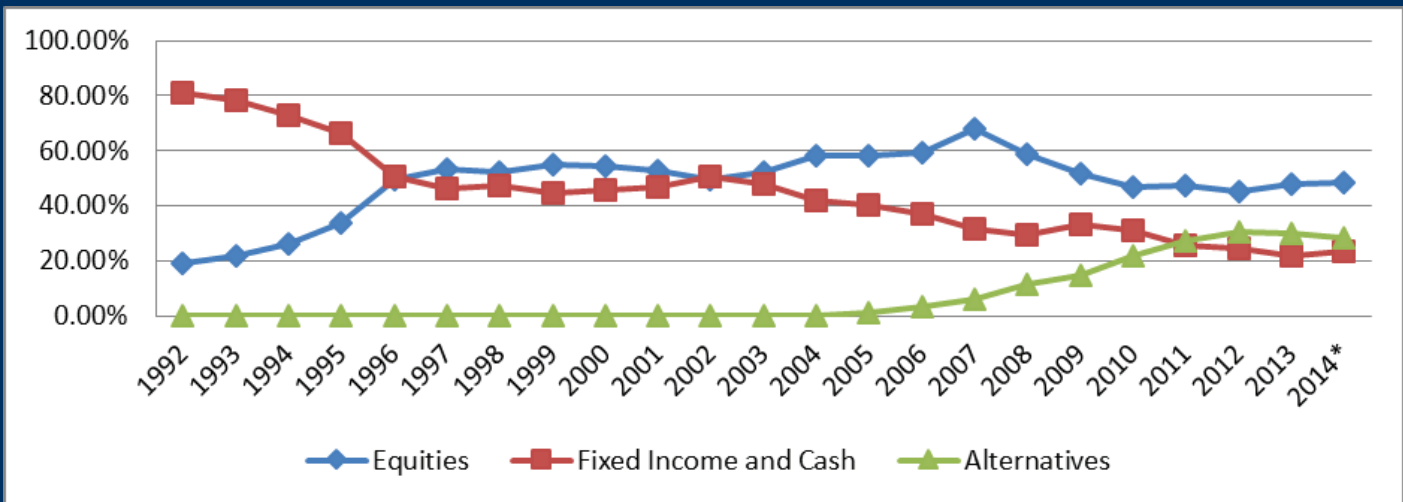
The same trends are present in the

**Figure 1**  
**Wilshire Asset Risk and Expected Returns 2015**



*Risk and return profiles for different asset classes.*

**Figure 2**  
**PSRS Investments by Asset Class, 1992 to 2014**



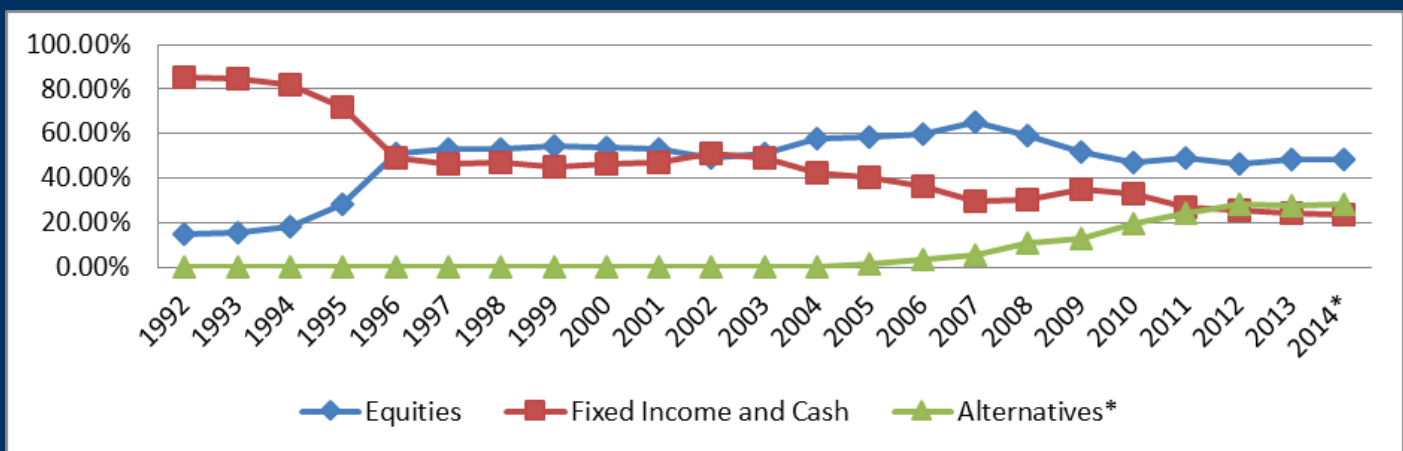
*More than 80 percent of PSRS investments were in fixed income and cash in 1992, compared with just under 25 percent in 2014.*

investment portfolios of PSRSSTL and KCPSRS, although to lesser degrees.<sup>19</sup> Fixed income and cash declined as a percentage of invested assets while equities and alternatives increased as a percentage of the portfolio. Unlike PSRS and PEERS, PSRSSTL was invested in alternative assets much earlier than 2005. Even in 1992, PSRSSTL had

6 percent of its invested assets in alternative investments. By 2014 the pension portfolio had 32 percent of all investments in alternative investments.

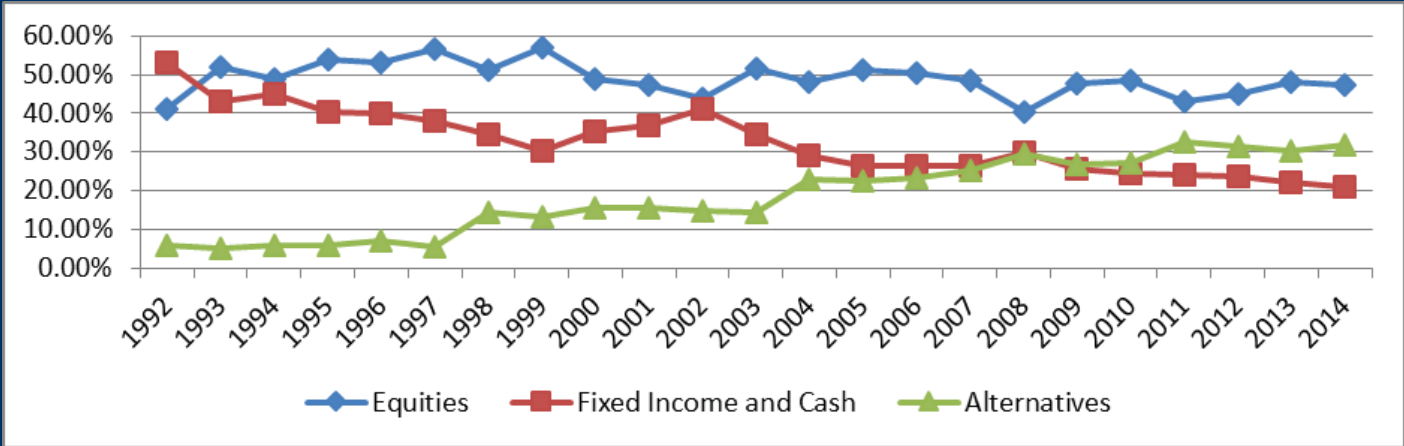
Equities already made up a majority of KCPSRS' investment portfolio in 1992 (56 percent). Alternatives made up less than 1 percent of the

**Figure 3**  
**PEERS Investments by Class, 1992 to 2014**



*Equities and alternatives in PEERS investments grew from under 20 percent in 1992 to over 75 percent in 2014.*

**Figure 4**  
**PSRSSTL Investments by Class, 1992 to 2014**



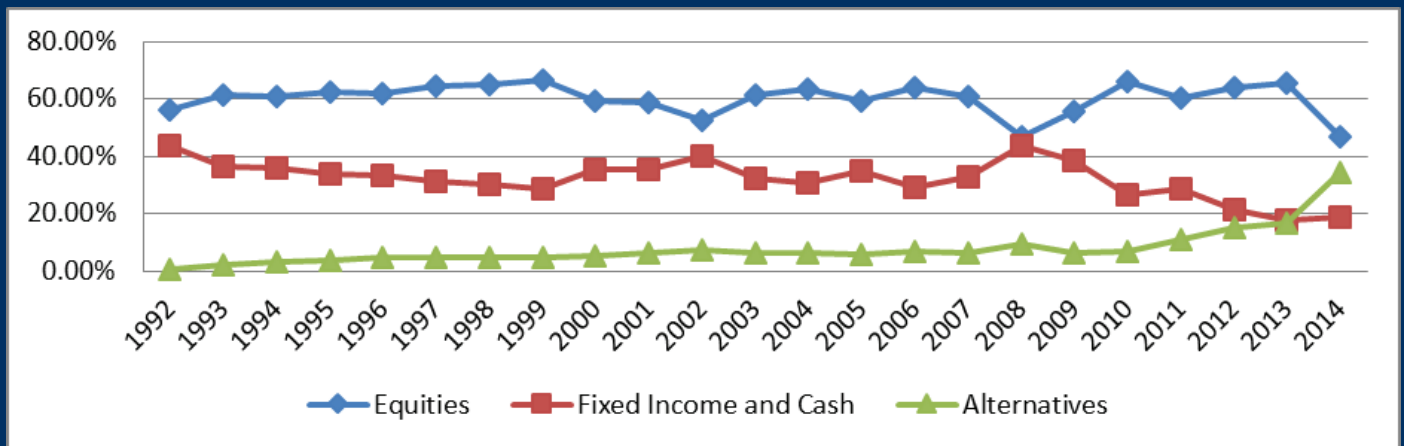
*PSRSSTL has seen its investments in equities remain relatively stable as compared to other pension plans, but alternative investments have grown at the expense of fixed income and cash.*

investment portfolio, and fixed income and cash made up the rest. Equities shrank from 56 percent in 1992 to 47 percent in 2014. Alternatives grew from .33 percent to 35 percent.

In summary, during the period of 1992 to 2014, all of the public school pension plans have

undergone significant shifts in the allocation of their invested assets. They have shifted from investment portfolios with little risk and consistent returns to portfolios with the potential for larger returns and greater risks. Figures 6, 7, and 8 show these changes by comparing the percent invested in each class in 1992 and 2014.

**Figure 5**  
**KCPSRS Investments by Class, 1992 to 2014**



*KCPSRS has seen its investments in equities also decline along with fixed income and cash as alternative investments make up a greater share of the plan's portfolio.*

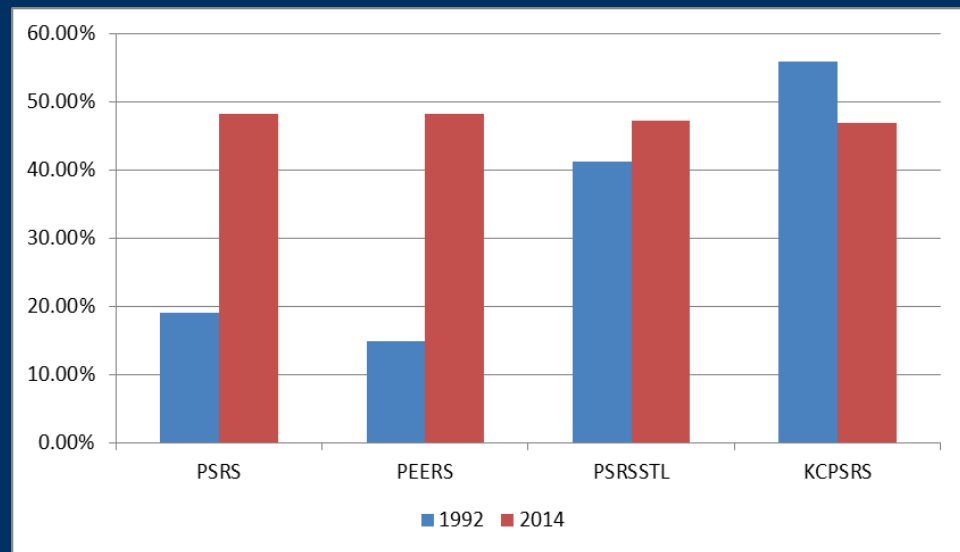
## CONCLUSION

Each pension system is shifting from safer assets such as fixed income and cash to riskier classes of investments. Notably, each plan has dramatically increased investments in alternatives. This shift mirrors the trend found in the Pew Report.

The fact that this shift is occurring does not, by itself, mean that PSRS, PSRSSTL, and KCPSRS are in worse financial shape. Investing in these assets can generate large returns that could actually improve the financial condition of these pensions. However, the large potential returns are accompanied by the larger risk that these pensions are taking with their investments. If these riskier assets instead lose value or even fail to generate large returns, the chance these pensions will be underfunded and the risk that taxpayers will have to make up the difference increases.

With such a large number of Missourians dependent upon their retirement from one of the pension systems highlighted here, it is imperative that the performance of these systems is closely monitored. Expected investment returns should be balanced against the potential risk each asset holds. There should be some mechanism to ensure that if returns do not

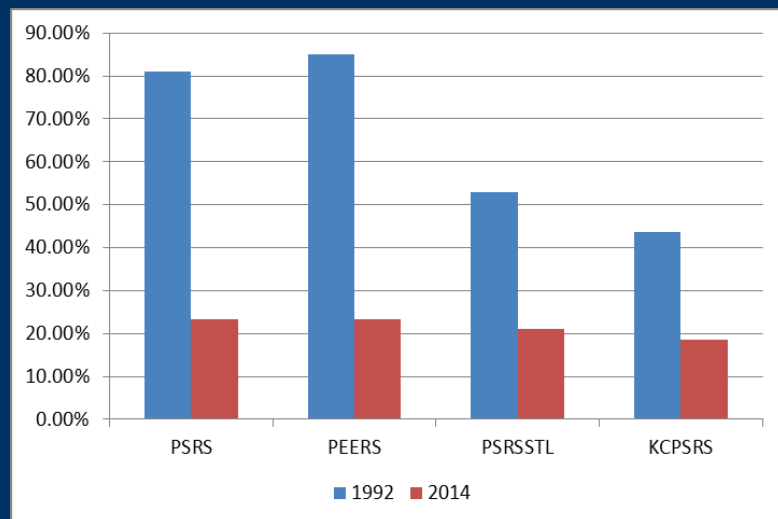
**Figure 6**  
**Percentage of Portfolio Invested in Equities in 1992 and 2014**



*Three pension plans (PSRS, PEERS, and PSRSSTL) have all seen large growth in equities as a percentage of the portfolio. KCPSRS has seen a small decline, but equities still constitute a large portion of the portfolio.*

come in as expected and there is a funding shortfall, taxpayers are protected. The authors of the Pew

**Figure 7**  
**Percentage of Portfolio Invested in Fixed Income and Cash in 1992 and 2014**



*Reliance on fixed income and cash has dramatically reduced in all pension plans in this study.*

*No matter what occurs, at the very least, policymakers should be aware that these pension plan returns are based on increasingly risky assets and acknowledge that fact when planning for the future.*

Report suggest:

*The findings presented in this brief point to the need for additional public information on plan performance, insight on best practices in fund governance, and attention to the effect of investment fees on plan health. Elected officials at the state and local levels can work with pension plan administrators to ensure that investment decisions are based on a thorough understanding of risk and cost. Government sponsors can demand better reporting of future expected costs and the associated downside risks, and then use this information to make decisions about ways to deal with poor outcomes, should they occur.*

To improve transparency, lawmakers could require pension plans to forecast assets using multiple assumptions on investment returns. What would the funding ratio for each of these plans be if returns

are 4 percent or 6 percent instead of 8 percent? This is something policymakers should know as it would allow them to choose the best way to structure contributions so that downside is minimized and that these plans can be adjusted to adapt to any unexpected downturns that may occur.

No matter what occurs, at the very least, policymakers should be aware that these pension plan returns are based on increasingly risky assets and acknowledge that fact when planning for the future.

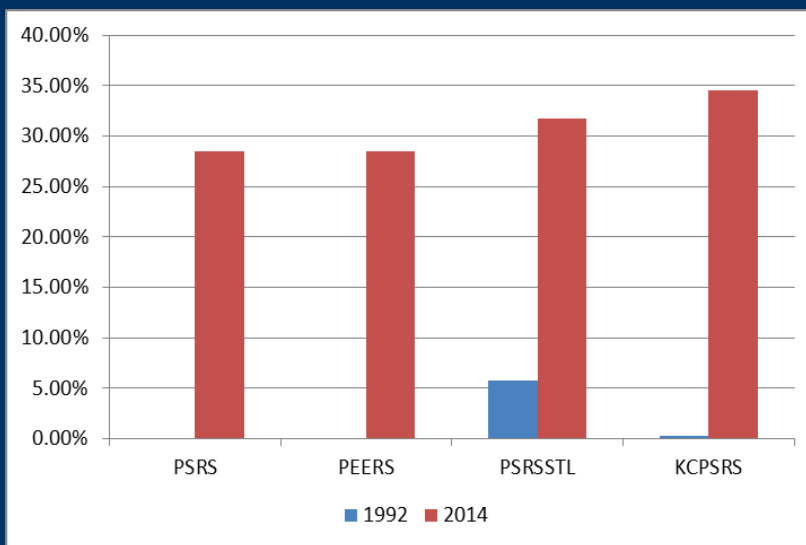
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**Figure 8**  
**Percentage of Portfolio Invested in Alternatives in 1992 and 2014**



*Alternatives, barely a consideration in 1992, now comprise more than a quarter of every pension plan in this study.*



## NOTES

<sup>1</sup> National Association of State Retirement Administrators, “NASRA Issue Brief.”

<sup>2</sup> Public School Retirement System of Missouri, “Financial Section.”

<sup>3</sup> The Pew Charitable Trusts, “State Public Pension Investment Shifts Over Past 30 Years.”

<sup>4</sup> Sharpe, “Capital Asset Prices.”

<sup>5</sup> Biggs, “Public Employee Pensions in Missouri.”

<sup>6</sup> Public School & Education Employee Retirement Systems of Missouri, “PSRS/ PEERS of Missouri 2014 Comprehensive Annual Financial Report.”

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Ibbotson and Sinquefeld, “Stocks, Bonds, Bills, and Inflation.”

<sup>11</sup> Damodaran, “Annual Returns on Stock, T. Bonds and T. Bills.”

<sup>12</sup> Sharpe, “Capital Asset Prices.”

<sup>13</sup> Cite Markowitz

<sup>14</sup> Based on author’s own calculations.

<sup>15</sup> This Chart is based on data collected from the Wilshire Consulting 2015 Report on State Retirement Systems: Funding Level and Asset Allocation (Exhibit 14), [https://www.wilshire.com/media/38890/wilshire\\_2015\\_state\\_funding\\_report.pdf](https://www.wilshire.com/media/38890/wilshire_2015_state_funding_report.pdf).

<sup>16</sup> We obtained the 2014 investment allocation information for PSRS and PEERS from the PSRS and PEERS 2014 Annual Report. The investment allocation information for PSRSSTL from the April 2015 Meeting Packet (view at <http://www.psrstl.org/board-meetings/board-meeting-packets.aspx>). Please note that the 2014 asset allocation information is taken from the asset allocation as of January 31, 2015. The PSRSSTL annual reports are usually as of December 31 of that calendar year. The investment allocation information for KCPSRS came from correspondence. You can view the document at [https://www.documentcloud.org/documents/2090002-](https://www.documentcloud.org/documents/2090002-kcpsrs-asset-allocation-123114.html)

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<sup>17</sup> Investment information provided through Comprehensive Annual Financial Reports and through correspondence. You can view the data sent by correspondence at <https://www.documentcloud.org/documents/1239457-pension-plan-groupings.html>. The data from the Comprehensive Annual Financial Reports can be found on their websites listed in the bibliography.

<sup>18</sup> Starting in 2014, PSRS and PEERS investments were pooled and thus are reported as one figure. Thus the percentages for equities, fixed income, and alternatives will be the same for both PSRS and PEERS starting in 2014.

<sup>19</sup> The investment allocation for PSRSSTL (1992-1998) and KCPSRS come from materials directly provided by PSRSSTL and KCPSRS. The investment allocation for PSRSSTL comes from its Comprehensive Annual Reports.

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