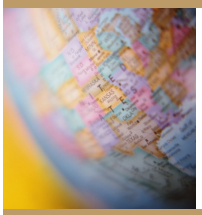


CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

State and Local Pension Plans

Number 64, April 2019

MAINTAINING TARGET ALLOCATIONS: EFFECTS ON PLAN PERFORMANCE

*By Jean-Pierre Aubry and Kevin Wandrei**

Introduction

State and local government pension funds currently manage about $4 trillion in assets for the nearly 20 million plan members. Generally, a plan's board of directors establishes the fund's target asset allocation, and the allowable ranges around those targets, based on input from outside investment consultants as well as the plan's own investment staff. But managing the asset allocation is the complex task given to the chief investment officer (CIO).

When investment performance causes the asset allocation to diverge from the targets, the CIO shifts money across various asset classes to bring the allocation back to the target – a practice known as rebalancing. Additionally, a CIO must navigate changes to target allocations that occur when plans periodically review and update their investment strategy – all the while keeping in mind the incoming contributions and upcoming benefit payouts for the plan. This *brief* describes the trends in target allocations for public plans, models their annual cash flows across major asset classes, and considers how different allocation styles within the target ranges might affect overall plan performance.

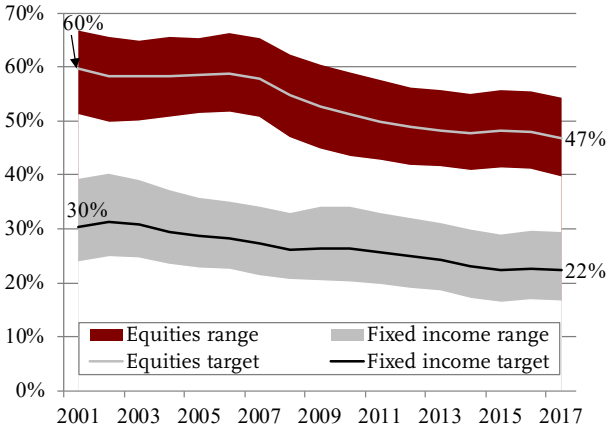
The *brief* proceeds as follows. The first section discusses target allocation policies for traditional stocks and bonds, as well as more illiquid assets such as private equity and real estate. The second section examines annual cash flows by asset class between 2001 and 2017. It finds that, due to shifting target allocations, many plans were net sellers of equities during the financial crisis, which locked in losses and partially excluded them from the subsequent rebound. The third section investigates the potential impact of allocation style on plan performance. The final section concludes that, during the period studied, target allocations mattered a lot for plan performance, and the adjustments available to CIOs had only a modest impact.

**Jean-Pierre Aubry is associate director of state and local research at the Center for Retirement Research at Boston College (CRR). Kevin Wandrei is a research associate at the CRR.* *The authors wish to thank Keith Brainard, Lynda Dennen Costello, and Andrew H. Sawyer for helpful comments.*

Target Asset Allocation

A plan's board of directors and/or investment committee periodically review and update the target allocation for their plan.[1] Since 2001, pension plans in the *Public Plans Database* have (on average) steadily reduced their allocations to traditional stocks and bonds, thereby increasing their target allocations to alternative asset classes like private equity, hedge funds, commodities, and real estate (see Figure 1).[2] While the target allocation for bonds has been on the decline since 2001, the target allocation to equities began its steep decline only just before the financial crisis.

Figure 1. Average Public Plan Target Allocations and Ranges for Equities and Fixed Income, 2001-2017

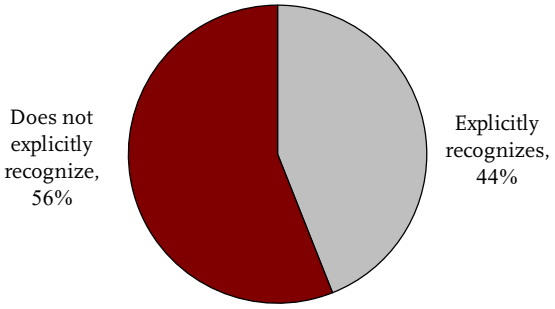


Source: Authors' calculations based on *Public Plans Database* (PPD) (2001-2017).

While the investment policy for most plans generally allows actual asset allocation to float about 7 percentage points above or below established targets, CIOs still have to move money across the various asset classes in order to stay within those ranges. In each year from 2001 to 2017, about one third of plans needed to shift money between equities, bonds, and other asset classes in order to stay within their target ranges.

Maintaining target allocations can be difficult with illiquid and private asset classes because it can be hard to move money into and out of these types of assets.[3] Most private equity (and many real estate) funds require multi-year commitments by the pension plan, over which time the investment fund largely controls when the plan provides capital to the fund and when the gains of the fund are distributed to the plan.[4] Additionally, plans often face a significant penalty if they wish to sell their stake in these funds prematurely.[5] Many investment policy statements have had to explicitly recognize the challenge that illiquid and/or private asset classes pose to regular rebalancing and the maintenance of target allocations (see Figure 2).[6]

Figure 2. Percentage of Plans Explicitly Recognizing Challenges to Illiquid and Private Assets



Source: Authors' calculations from investment policy statements.

Cash Flows by Asset Class

The following analysis examines the annual cash flows by asset class.[7] The calculation uses data on the asset allocation and asset class returns provided in plan financial reports. Table 1 (on the next page) provides an example of the methodology for Montana PERS in 2003. First, asset allocation is converted to dollars by multiplying the reported allocation percentages in 2002 by the plan's total assets in 2002. The next step is to estimate hypothetical 2003 dollar values for each asset class based on the reported return for each asset class. Next, the actual dollar allocations in 2003 are calculated by multiplying the reported allocation percentages in 2003 by the plan's total assets in 2003. The annual flow for each asset class is the difference between the hypothetical and actual dollar

allocation in 2003. This exercise for Montana PERS shows that, in fiscal year 2003, the plan was a net buyer of equities and a net seller of fixed income.

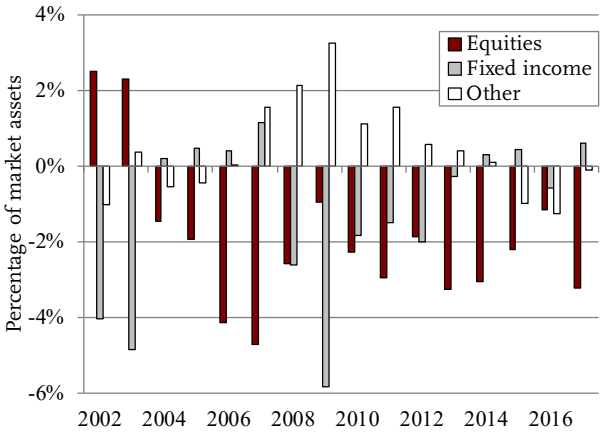
Table 1. Asset Class Flows for Montana PERS, Millions of Dollars, 2003

Item	Equities	Fixed income	Alternatives
1) 2002 asset allocation percentages	52.9%	40.5%	6.4%
2) 2002 total assets	$2,564	$2,564	$2,564
3) 2002 asset values [1] x [2]	$1,357	$1,039	$164
4) 2002-2003 investment return	0.7%	13.0%	-3.7%
5) Hypothetical 2003 values [3] x (1+[4])	$1,366	$1,174	$158
6) 2003 asset allocation percentages	57.2%	34.2%	8.7%
7) 2003 total assets	$2,696	$2,696	$2,696
8) 2003 asset values [6] x [7]	$1,541	$921	$234
9) 2003 flows [8] – [5]	$175	($253)	$75

Source: Authors' calculations based on PPD (2001-2017).

Replicating this exercise for all public plans provides a rough picture of the aggregate asset class flows for these plans (see Figure 3). Importantly, the aggregate cash flow analysis shows how annual cash flows can be the result of two types of asset allocation activity: rebalancing and a shift in target allocation. When equity values declined during the dot.com bust of the early 2000s, money flowed into stocks and out of bonds, with little activity in the other asset classes. This pattern aligns with a standard rebalancing approach in which money flows into asset classes that underperform and out of asset classes that outperform in order to maintain a relatively steady asset allocation. However, when equity values declined dramatically during the 2008-2009 financial crisis, money flowed out of equities. The reason is that plans were shifting their target allocations away from traditional stocks and bonds and into alternatives based on their evolving beliefs about the capital markets and adequate portfolio diversification. The timing of this shift likely locked in some of the equity losses and partially excluded plans from the subsequent rebound.[8]

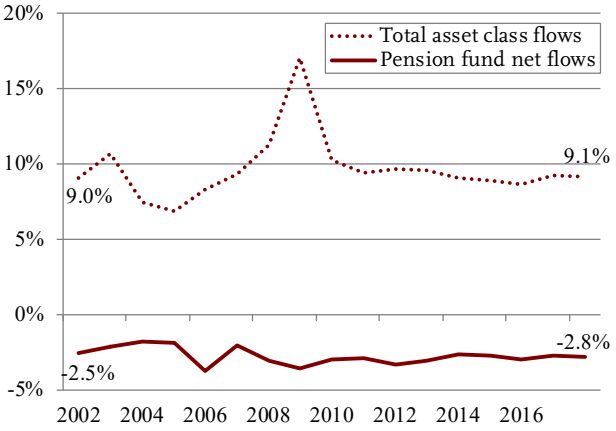
Figure 3. Annual Net Flows by Asset Class, 2002-2017



Source: Authors' calculations based on PPD (2001-2017).

The cash flow analysis also reveals how a small net flow for the pension fund can hide large flows into and out of various asset classes. In the case of Montana PERS, the net flow for the fund was about negative $3 million in 2003, or just over 0.1 percent of assets. But the total money moving either into or out of stocks, bonds, and alternatives was $503 million – nearly 20 percent of its assets. In the aggregate, the net flows for pension funds have hovered between negative 2 and 3 percent of assets since 2001, while total money flowing either into or out of various asset classes has generally hovered around 9 percent (see Figure 4).

Figure 4. Pension Fund Flows and Asset Class Flows, 2002-2017



Source: Authors' calculations based on PPD (2001-2017).

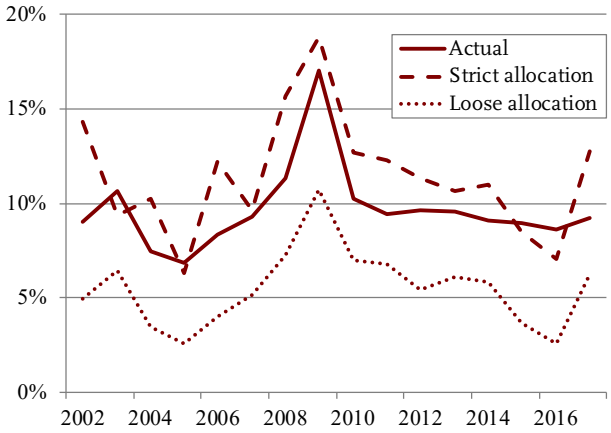
Impact of Allocation Style on Plan Performance

Clearly, shifting money into and out of asset classes to remain close to target allocations incurs direct transaction costs.[9] But it can also incur an opportunity cost if it requires moving money away from asset classes that are expected to achieve relatively higher returns. Given these two facts, public plans' chosen allocation within the specified target ranges likely had some impact on overall plan performance. An interesting question, then, is how much.

To estimate the maximum potential impact of allocation style, the analysis models public plans under two opposite approaches to managing asset allocation. For the purposes of this *brief*, the first approach is called strict allocation. It assumes plans annually move money into and out of asset classes so that the end-of-year asset allocations precisely match the target allocations. The second approach is called loose allocation. It assumes plans annually move money into and out of asset classes only to the extent required to keep asset allocation within the maximum or minimum target *ranges*.

Figure 5 shows the estimated year-by-year asset class flows under the two allocation approaches, in addition to the actual flows for public plans. The data suggest that, on average, the actual activity of public plans is more like the strict approach than the loose approach. However, the loose approach produces fewer asset class flows and, hence, slightly lower transaction costs.[10]

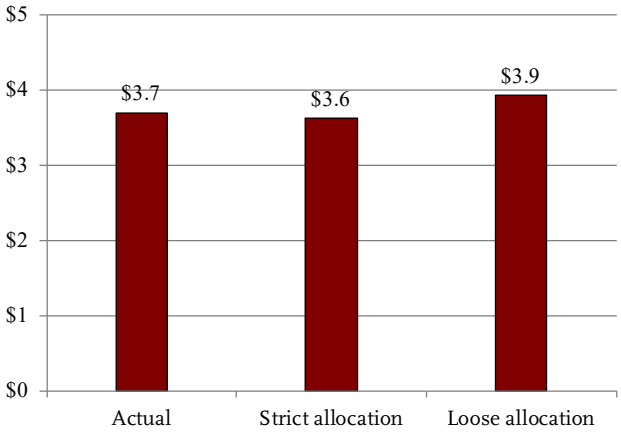
Figure 5. Total Asset Class Flows as a Percentage of Assets, under Various Allocation Approaches, 2002-2017



Source: Authors' calculations based on PPD (2001-2017).

Separate from the lower transaction costs, the looser approach to rebalancing results in overweighting an asset class when it outperforms and underweighting when it underperforms. Over the 2001-2017 period, a loose allocation approach would have modestly improved plan performance compared to a strict rebalancing approach (see Figure 6).[11]

Figure 6. Total Assets under Various Allocation Approaches, Billions of Dollars, 2017



Source: Authors' calculations based on PPD (2001-2017).

Conclusion

CIOs shift money across various asset classes to keep pension asset allocations within specified ranges of the target allocations established by retirement system boards and/or their investment committees. The data suggest that, each year, about one-third of plans must shift money between equities, bonds, and other asset classes in order to stay within target ranges. And, a simple model of annual asset class flows from 2001 to 2017 shows that, in aggregate, public plans moved 8-10 percent of their assets each year.

When equity values declined during the dot.com bust of the early 2000s, money flowed into stocks and out of bonds (with little movement in other asset classes) – as would be expected from the normal rebalancing required to maintain a steady asset allocation. In contrast, when equity values declined during the financial crisis, money flowed out of equities because plans were shifting their target allocations away from equities and bonds and into alternatives based on their evolving beliefs about the capital markets and

adequate portfolio diversification. The timing of this shift locked in some of the decline in equity values and partially excluded plans from the stock market rebound experienced from 2010 to 2017.

Finally, an analysis of asset allocation styles suggests that plans try to keep their actual allocations relatively close to their targets and that a looser approach to allocation – aimed only at staying within target ranges – could have improved plan performance modestly over the 2001-2017 period.

Endnotes

1 While the board of directors is generally the entity responsible for the oversight of pension fund investments, some retirement systems entrust this task to a separate government-run investment entity. For example, the Wisconsin, Massachusetts, and Connecticut Retirement Systems each abrogate the oversight of pension fund investments to the State Wisconsin Investment Board (SWIB), the Massachusetts Pension Reserves Investment Management Board (PRIM), and the Connecticut Investment Fund (CIF), respectively.

2 Plans report a wide variety of asset classes in their Comprehensive Annual Financial Reports (CAFRs) or Investment Reports. Reported asset classes were reclassified into one of the following eight: public equities, fixed income, private equity, real estate, commodities, hedge funds, cash, and other. Generally, the analysis in this *brief* excludes plans for which the available data on target allocation accounts for less than 90 percent of the plan's portfolio. This approach results in a sample of about 90 plans, representing 75 percent of assets in the *Public Plans Database*.

3 For example, the policy statement for Colorado PERA states, "The Board recognizes, however, the inherent difficulty in managing the allocations to the illiquid asset classes. While the Board expects there to be a process in place that attempts to estimate capital calls and distributions in the non-marketable asset classes, it recognizes the difficulty in buying and selling partnership interests or real estate to manage the Fund's allocation to these asset classes."

4 As of 2017, over half of major state and local pension plans had outstanding commitments to private equity and real estate funds that amounted to between 4 percent and 10 percent of their assets.

5 Rather than pay an exit penalty – if the private equity fund is performing strongly – primary investors may be able to sell their stake to a secondary or late secondary investor at a premium.

6 The investment policy statement for CalSTRS says, "Because of appraisal valuation and the illiquid market nature of appraised assets, exceeding the maximum policy range allocation will trigger a conscious review by the chief investment officer, the specialty and general consultants, and the Investment Committee rather than an automatic rebalancing." The investment policy statement for Kansas City ERS describes how illiquid assets might affect rebalancing of the portfolio as a whole, "...rebalancing efforts may be impaired by the real assets and opportunistic portfolios, due to liquidity terms of the products utilized." The investment policy statement for the Massachusetts Pension Reserves Investment Management (PRIM) Board states, "The PRIM Board acknowledges that market conditions or circumstances beyond PRIM's control may lead to asset class weighting being temporarily out of their target ranges, especially as those ranges relate to illiquid asset classes."

7 Ideally, quarterly or monthly data would be used to assess plans' investment decisions. However, that level of detail is not always publicly available and, if so, not for extended periods of time. For that reason, this analysis relies on annual data to provide a rough picture of plan investment activities.

8 The ultimate impact of the shift away from traditional equities and into alternatives depends on the equity betas of the alternative asset classes. Prior research has shown that plans in the bottom quartile of annualized returns since 2001 have shifted away from traditional equities and into alternative asset classes with lower equity betas, such as hedge funds and commodities (Aubry et.al, 2018). Those that shifted into alternative asset classes with higher equity betas, such as private equity and real estate investment trusts, fared better.

9 To reduce transaction costs, some pension funds have an ability to do free cross trades, a practice where buy and sell orders for the same asset are offset without recording the trade on the exchange. While this activity can reduce transaction costs, it is generally not permitted on major exchanges. In addition, plans try to use cash flows, overlay strategies, and relatively cheap derivative contracts to adjust exposure (i.e., rebalance) rather than trading the actual asset classes.

10 Discussions with pension practitioners confirmed that transaction costs make up a relatively small, but meaningful, component of rebalancing costs. For example, based on a 2018 CEM study, the reduced flows under the loose approach would decrease annual transaction costs by only about 6 basis points. CEM finds transaction costs to be about 25 percent of overall investment expenses. Applying this ratio to the average annual investment expense reported by public plans (about 36 basis points), would result in a baseline annual transaction cost of about 9 basis points. But, the average difference in the asset flows under the strict and loose approaches is only about 5.75 percent of assets – about two thirds of the average yearly flows estimated for public plans. So, a rough estimate of the annual difference in transaction costs between the two approaches would be about 6 basis points.

11 Perold and Sharpe (1988) highlight the role that market volatility plays in the outcome of rebalancing strategies. In a volatile market, more stringent rebalancing improves outcomes. However, in a trending market such as that experienced from 2010 to 2017, buy and hold strategies win the day. As such, the results of this analysis are specific to the market conditions experienced from 2001 to 2017 and may not hold for other periods.

References

Aubry, Jean-Pierre, Anqi Chen, Alicia H. Munnell, and Kevin Wandrei. 2018. "What Explains Differences in Public Pension Returns Since 2001?" *State and Local Plans Issue in Brief* 60. Chestnut Hill, MA: Center for Retirement Research at Boston College.

CEM Benchmarking. 2018. "Transaction Costs Amongst Large Asset Owners." Toronto, Canada.

Perold, André F. and William F. Sharpe. "Dynamic Strategies for Asset Allocation." *Financial Analysts Journal* 44(1): 16-27.

Public Plans Database. 2001-2017. Center for Retirement Research at Boston College, Center for State and Local Government Excellence, and National Association of State Retirement Administrators. Available at: https://publicplansdata.org/

About the Center

The mission of the Center for Retirement Research at Boston College is to produce first-class research and educational tools and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception in 1998, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

Affiliated Institutions

The Brookings Institution
Mathematica – Center for Studying Disability Policy
Syracuse University
Urban Institute

Contact Information

Center for Retirement Research
Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467-3808
Phone: (617) 552-1762
Fax: (617) 552-0191
E-mail: crr@bc.edu
Website: https://crr.bc.edu

The Center for Retirement Research (CRR) gratefully acknowledges the Laura and John Arnold Foundation for its support of this research. The opinions and conclusions expressed in this *brief* are solely those of the authors and do not represent the opinions or policy of Boston College, the CRR, or the Laura and John Arnold Foundation.