

Memorandum

To	Ohio Retirement Study Council
From	RVK, Inc.
Subject	Net Fiduciary Position vs. Time-Weighted Return: Assessment of the STRS/OPERS Reported-vs-“Audited” Return Comparison
Date	September 24, 2026

Executive Summary

The Mendenhall & Sutter (M&S) article uses a twenty-year comparison of “reported” versus “audited” (their terms) investment returns to argue that State Teacher Retirement System of Ohio’s (STRS) bonus-linked reporting practices reflect a sustained pattern of opportunistic overstatement that can only be explained by an equally deliberate effort to maximize investment PBI (performance-based incentive) staff compensation. The authors contend that a similar examination using their methodology of the returns of the Ohio Public Employees Retirement System (OPERS)—proffering OPERS as a clean statistical control—shows no comparable pattern, proving their thesis.

Having reviewed the M&S article at the request of the ORSC, the underlying STRS and OPERS Comprehensive Annual Financial Reports (CAFRs), the industry standard time-weighted investment return calculations used by the funds, external audits recently conducted for the plans, along with phone interviews with STRS staff, the STRS Board’s independent consultant, and ORSC staff (the latter following our independent review of the respective data and documents), we offer the following high-level observations, which are discussed in greater detail in the body of this memo.

1. A substantial portion of the observed divergence reported by M&S, and the basis of their allegations of manipulation to maximize performance-based incentive compensation, is attributable to **routine, well-documented differences between money-weighted return (MWR) and time-weighted return (TWR) methodologies**. As to whether the authors simply do not fully understand the difference between these two well understood methodologies widely used throughout pension fund investment reporting or deliberately chose a methodology that supported preordained conclusions, we have no opinion nor basis for any. This is true not only in this case but for all the observations that emerge from our review.
2. The use of OPERS as a comparator, which M&S offers as clear confirmation of their claims regarding STRS, is materially weakened by a seeming lack of understanding regarding the main drivers of MWRs. Because MWRs are driven not just by returns on invested fund assets but **also by the time those assets are actually invested (or not) and all other cash flows in and out of the fund**, the differences between MWRs and TWRs that M&S use as the foundation of their entire analysis and resulting inferences are **structurally** larger at STRS than at OPERS. And by

structurally larger, we mean that they differ for reasons unrelated to governance or compensation design—the behavioral factors targeted by M&S—and only partially for reasons related to investment returns. In our judgment, this methodological flaw renders M&S’ confirmatory use of OPERS vs STRS in their analysis unreliable at best, irrelevant at worst (see observation #5 below for more on this). Again, we have no opinion as to the reasoning behind the authors’ choices, merely their relevance and consistency (or lack thereof) with industry standard institutional investment methods and practices.

3. Of notable concern to us in our independent review is that **the single largest data point in the paper’s dataset (fiscal year 2022) does not match STRS’ own audited financial statements**. As discussed in Section 7, this discrepancy traces to a methodology substitution in the article’s sourcing, not an inconsistency in STRS’ own financial reporting. This is not a trivial concern, as the single largest contributor to the purported “gap” reported by M&S using their own methodology occurs **in this single year**. Yet there is no explanation for this data anomaly, one that is critical to their claims but not easily uncovered by those simply reading their article.
4. STRS and OPERS both formally disclose a GASB 67 MWR in their **audited** financial statements (STRS Ohio 2022 CAFR, “Schedule of Investment Returns — Pension,” p. 36; OPERS 2022 Annual Comprehensive Financial Report, “Schedule of Investment Returns — Defined Benefit Portfolio” [Required Supplementary Information] p. 80). This (should be) the actual source of the paper’s “audited” figures, rather than the simplified net-fiduciary-position calculation the article describes as its core methodology.
5. STRS’ defined benefit plan has run a persistent, one-directional net cash outflow (benefit payments exceeding contributions by roughly 4.5% to 6.7% of fund assets) in every one of the last ten fiscal years—a **structural** condition of the pension plan itself that mechanically, predictably, and materially contributes to the kind of one-directional MWR-vs-TWR gap the article attributes to opportunistic behavior intended to maximize performance-based incentive compensation. This structural attribute can be seen frequently throughout longstanding public pension plans. By comparison, OPERS’ comparable pension plan runs a meaningfully smaller net outflow (roughly 3.5% to 4.2% of fund assets) throughout the identical period. This is a genuine **structural** difference between the two systems—not a coincidence—and it helps explain why the effect is smaller in magnitude at OPERS. It also explains our observation that the OPERS vs STRS comparison used by the authors to corroborate their conclusions regarding opportunistic compensation maximizing behavior at STRS is fundamentally flawed. In short, it materially undermines the M&S’s use of OPERS as a viable comparator to STRS.

6. The OPERS figures feeding the article’s “reported” column (Mendenhall & Sutter (2026), Table 1, p. 15) are not solely OPERS’ defined benefit plan returns, rather they are a blended figure across **multiple** OPERS plans—specifically the Defined Benefit, Health Care, and Defined Contribution portfolios. Corrected to reflect only the defined benefit plan, OPERS shows a far more persistent, mostly one-directional gap between returns in 16 of 20 years versus that reported by M&S—generally similar to what M&S finds for STRS. This materially undermines the article’s use of OPERS’ apparent randomness in their analysis as evidence that STRS’ pattern is behavioral and deliberate in a unique fashion rather than structural in nature.
7. The article’s “reported” figure for STRS (Mendenhall & Sutter (2026), Table 1, p. 15) incorrectly references STRS’ **gross-of-fees** return, while OPERS’ “reported” returns are **net-of-fees**. This is an apples-to-oranges data mismatch baked into the comparison itself. STRS discloses a fee drag of 11–14 basis points per year that would need to be removed to make the two systems’ “reported” figures comparable. This has implications for M&S’ analysis discussed in greater detail later in this memo.
8. STRS’ own **audited** MWR FY2022 return, confirmed identically in both the FY2022 and FY2023 CAFRs, is -3.55%, close, but not identical, to the article’s “reported” figure of -3.61%, but **materially different** from the article’s claimed “audited” figure of -5.40%. Taken alone, this is a material difference that requires explanation (or correction). In the context of the M&S analysis, this is of even greater concern as this single year drives a disproportionate share of the article’s headline statistics that purport to justify their claims of misbehavior at STRS. Upon review of official STRS documents, the reason for the discrepancy appears to be primarily driven by a difference in calculation methodology: the CAFR return reflects a true MWR calculation, whereas the purported “audited” return reflects a simplified actuarial gain (loss) return calculation.

Each observation is discussed in greater detail below, organized around what we believe are pertinent questions to be raised.

1. Changes in Net Fiduciary Position vs. Time-Weighted Return: What Each Measures and Why Their Differences Matter!

Changes in Fiduciary Net Position

Every CAFR includes a *Statement of Changes in Fiduciary Net Position*, which reconciles a plan’s beginning and ending net assets through a single equation:

$$\text{Beginning Net Position} + \text{Total Additions} - \text{Total Deductions} = \text{Ending Net Position}$$

The components are:

- **Additions:** member contributions, employer contributions, net investment income or loss, and miscellaneous items (transfers between plans, other income).
- **Deductions:** benefit payments, refunds of contributions, administrative expenses, and transfers.

This schedule is, by design, a comprehensive sources-and-uses statement of the fund's balance sheet—but note that investment returns are only one factor of many that determine the measure of change in a plan's assets during a given period. Investment returns are commingled with the plan sponsor's own funding decisions (how much was contributed) and benefit obligations (how much was paid out). It is not, by itself, a rate of return. Indeed, given only the starting and ending values for the net fiduciary position, it is impossible to calculate investment performance.

The Money-Weighted Rate of Return (GASB 67)

GASB Statement No. 67 requires every public pension plan to separately disclose a **MWR** as Required Supplementary Information, subject to the independent auditor's opinion. We confirmed this schedule exists in both STRS' and OPERS' CAFRs (STRS: "Schedule of Investment Returns — Pension"; OPERS: "Schedule of Investment Returns, Defined Benefit Portfolio"). The MWR is a dollar-weighted internal-rate-of-return calculation: it explicitly incorporates **the timing and magnitude of all cash inflows and outflows to and from the fund (e.g., contributions, cash returns and expenditures related to investments, benefit payments, etc.)** during the year, weighting each cash flow by how long it was **actually invested**.

The Time-Weighted Rate of Return (Industry/GIPS Standard)

By contrast, a **TWR**—the CFA Institute's Global Investment Performance Standards (GIPS) benchmark for evaluating investment managers—breaks the measurement period into sub-periods at each cash flow date, calculates a return for each sub-period, and geometrically links them. TWR is deliberately constructed to **neutralize the size and timing of cash flows**, so that it **isolates investment performance** from the plan sponsor's independent decisions about contribution levels and benefit payment schedules.

These two metrics are **not** competing estimates of the same underlying fact; they answer **different questions by design**, and GASB requires both for that reason (see section 6 below). We compared each system's disclosed GASB MWR to the article's Table 1 "Audited Rate of Return" column and found close alignment—typically within two or three tenths of a percentage point—in nine of the ten most recent

years for STRS. By contrast, the article’s self-titled “audited” series, which utilizes the highly simplified beginning/ending balance calculation described in the text, appears to be sourced from actuarial documents. The article’s calculations (using this data we presume) approximates each system’s official GASB MWR disclosure, however they **fail to match it** due to methodological differences (described further in Section 7). Since the authors have thus far refused to provide their full dataset to the ORSC (and thus make it available to us) we have no way of confirming this discrepancy nor understanding their reason for using the actuarial data rather than the system’s GASB disclosure as the primary source.

Fiscal Year	STRS CAFR GASB MWR	Article’s “Audited”	Difference
2013	13.64%	13.50%	+0.14
2014	16.78%	16.50%	+0.28
2015	5.32%	5.20%	+0.12
2016	0.64%	0.40%	+0.24
2017	14.19%	14.10%	+0.09
2018	9.55%	9.50%	+0.05
2019	6.94%	6.60%	+0.34
2020	2.99%	3.60%	−0.61
2021	29.24%	29.00%	+0.24
2022	−3.55%	−5.40%	+1.85

Source: STRS Ohio 2022 CAFR, “Schedule of Investment Returns — Pension,” p. 36; Mendenhall & Sutter (2026), Table 1. Nine of ten years align closely; FY2022 is a significant outlier, discussed in Section 7.

The same comparison holds for OPERS. OPERS’s CAFR discloses its own GASB 67 MWR for the Defined Benefit Portfolio, with a caveat noted directly in the schedule: “GASB 67 requires that data be reported for 10 years; however, data prior to 2014 is not available.” For the nine years available, the disclosed MWR aligns closely with the article’s OPERS “Audited” column—typically within a couple tenths of a percentage point, and without the single-year outlier we found at STRS:

Fiscal Year	OPERS CAFR GASB MWR (DB Portfolio)	Article’s “Audited”	Difference
2014	7.0%	6.83%	+0.17
2015	0.4%	0.31%	+0.09
2016	8.3%	8.22%	+0.08
2017	16.8%	16.71%	+0.09
2018	−2.9%	−2.97%	+0.07

Fiscal Year	OPERS CAFR GASB MWR (DB Portfolio)	Article's "Audited"	Difference
2019	17.2%	17.08%	+0.12
2020	11.7%	11.60%	+0.10
2021	15.3%	15.46%	-0.16
2022	-12.1%	-12.31%	+0.21

Source: OPERS 2022 Annual Comprehensive Financial Report, "Schedule of Investment Returns — Defined Benefit Portfolio" (Required Supplementary Information) p. 80; Mendenhall & Sutter (2026), Table 1. All nine available years align closely, with no comparable single-year outlier to STRS's FY2022.

Taken together, the STRS and OPERS tables above support the same conclusion for both systems: the article's "audited" figures closely track each system's own GASB-mandated, auditor-covered MWR, and the divergence documented later in this memorandum arises primarily from what is being compared against that audited figure—not from any defect in the audited figure itself.

2. What M&S Methodology Systematically Does When Applied to STRS

STRS' defined benefit plan is **cash-flow negative**: every year from FY2013 through FY2022, benefit payments and refunds have exceeded member and employer contributions. Using figures from the STRS 2022 CAFR's "Changes in Fiduciary Net Position" statistical schedule (pp. 80–81):

Fiscal Year	Contributions (\$000s)	Deductions (\$000s)	Net Cash Flow (\$000s)	Net CF as % of Beginning Assets
2013	2,370,821	6,397,407	(4,026,586)	-6.63%
2014	2,460,040	6,763,784	(4,303,744)	-6.65%
2015	2,637,227	6,921,202	(4,283,975)	-6.04%
2016	2,756,747	7,356,298	(4,599,551)	-6.53%
2017	2,957,659	7,242,274	(4,284,615)	-6.47%
2018	3,044,830	7,334,870	(4,290,040)	-6.04%
2019	3,129,633	7,322,511	(4,192,878)	-5.71%
2020	3,216,990	7,314,046	(4,097,056)	-5.53%
2021	3,281,630	7,334,812	(4,053,182)	-5.57%
2022	3,448,481	7,433,752	(3,985,271)	-4.46%

Source: STRS Ohio 2022 CAFR, "Changes in Fiduciary Net Position," Defined Benefit Plan, pp. 80–81.

A persistently negative net cash flow has a predictable, mechanical effect on a dollar-weighted (MWR) return relative to a TWR. Because a portion of the fund’s assets net of a smaller contribution inflow is continuously withdrawn throughout the year to pay benefits, a smaller capital base is “at work” (aka invested) earning returns for the later part of each period than a pure market-value (time-weighted) calculation would assume. Applied consistently, year after year, to a fund with a **persistently negative** cash flow, this produces a **persistently one-directional** gap between MWR and TWR—not a randomly distributed one.

This reframes the article’s central statistical claim. The article treats the fact that STRS’ reported return exceeded its audited return in 19 of 20 years as statistically improbable under random measurement error ($p < .0001$) and interprets this as evidence of deliberate overstatement. But a persistent, one-directional cash-flow drag **is not random error**—it is precisely the outcome one would expect given the net negative cash flow in the system. In such a case, a one-directional MWR-vs-TWR gap would be expected. The 19-of-20 pattern is consistent with (and substantially explained by) STRS’ own cash flow structure, **independent of any behavior on the part of investment staff or administrators**.

3. Why the Divergence Is Smaller at OPERS

M&S claim that their methodology yields a much smaller difference between that system’s CAFR-reported-MWR and STRS. From this they conclude that it provided support for their claim that the larger and more persistent differences they calculate at STRS are indicative of deliberate manipulation of returns there. But is that conclusion warranted (even assuming their calculation methodology and dataset if provided proved factual)?

We performed the identical calculation only for OPERS’ Traditional Pension Plan (its defined benefit plan, and the correct comparator to STRS’s DB Plan—not OPERS’ Combined, Member-Directed, or Health Care funds—see below on this point) using OPERS’ reported 2022 CAFR:

Metric	STRS (DB Plan) 2013–2022 Range	OPERS (Trad. Pension Plan) 2013–2022 Range
Net cash flow, % of beginning net position	-4.46% to -6.65%	-3.54% to -4.23%
Average annual reported-vs-audited gap (per article’s Table 1)	+0.33 percentage points	+0.08 percentage points
Directional pattern of gap (per article)	19 of 20 years directionally higher – persistent	8 of 20 years directionally higher – bi-directional

Sources: STRS Ohio 2022 CAFR and OPERS 2022 Annual Comprehensive Financial Report, “Changes in Fiduciary Net Position” schedules; Mendenhall & Sutter (2026), Table 1.

Two things follow from this comparison. First, **OPERS’ net cash outflow is consistently and meaningfully smaller than STRS’**. The importance of this factual difference is discussed earlier in the section of our memo. Indeed, there is essentially **no overlap** between the two systems’ ranges across the full ten years. Put another way, the systems’ entire ten-year distributions are cleanly separated, with no single year of overlap (OPERS’ worst year in terms of net cash outflow was -4.23%, which is still smaller than STRS’ best year in terms of net cash outflow of -4.46%). A smaller structural cash-flow drag **would be expected** to produce a smaller average MWR-vs-TWR gap, which is exactly what the article’s own data shows (0.08pp at OPERS vs. 0.33pp at STRS).

Second, a smaller structural effect is more easily overwhelmed by ordinary sources of period-to-period noise (small valuation-timing differences, month-to-month cash flow variation), which would be expected to produce a **bidirectional, less statistically distinguishable** pattern at OPERS—again consistent with the article’s own finding that OPERS overstated returns in only 8 of 20 years. M&S see this as validating their claims of manipulation at STRS given their persistent directional difference. But clearly it is nothing more than a reflection of the structural difference in annual net cash flow between the two systems.

The article treats OPERS as a same-state, same-macro-environment “control” that isolates the effect of STRS’ performance-based incentive compensation structure. But the two systems differ, measurably and persistently, on precisely the variable most directly responsible for MWR-vs-TWR divergence. OPERS is not a clean control for this comparison; it is a system with a structurally smaller version of the same mechanical effect.

4. The OPERS Comparison Itself Is Not Apples-to-Apples: Blended vs. Defined-Benefit-Only Returns

The failure to understand the effect of structural differences in net cash flow between STRS and OPERS is not the only problem here. A further issue affects the comparison independent of cash flow structure. M&S (perhaps accidentally) chose to use the OPERS figures that feed the article’s “reported” column **that are not solely OPERS’ defined benefit plan returns**. Instead, they are a **blended figure across OPERS’ Defined Benefit, Health Care, and Defined Contribution portfolios**. The OPERS 2022 CAFR reports both figures explicitly, on two different pages, for FY2022:

Source	FY2022 Return
OPERS 2022 CAFR, p. 101 — “Total Investment Returns” (Defined Benefit + Health Care + Defined Contribution, blended)	-12.49%

Source	FY2022 Return
OPERS 2022 CAFR, p. 109 — “Defined Benefit Portfolio Returns” (Defined Benefit only)	-12.03%

Source: OPERS 2022 Annual Comprehensive Financial Report, Investment Section, pp. 101, 109.

The M&S article’s Table 1 “Reported Rate of Return” for OPERS in FY2022 is **-12.49%**, which matches the blended, **all-plans** figure from p. 101, **not the properly isolated defined-benefit-only figure** from p. 109. **This is not a one-year coincidence.** The OPERS CAFR’s “Historical Investment Returns” schedule (p. 102) reports both a blended “Total Portfolio Return” and a “Total Defined Benefit Return” for every year from 2003 through 2022. When we compared the article’s full twenty-year OPERS “reported” series against both CAFR columns, it matched the **blended** figure, within rounding, in **all twenty years** (maximum discrepancy: 0.03 percentage points)—and **did not match** the defined-benefit-only figure in any year where the two diverge.

This matters a great deal for the article’s comparative design, and the effect runs in a direction worth noting:

Comparison	Avg. Annual Gap	Years Overstated (of 20)
Article’s own OPERS figures (blended reported vs. audited)	+0.09pp	8 of 20
Corrected: OPERS defined-benefit-only reported vs. article’s audited	+0.19pp	16 of 20
For reference — STRS (reported vs. audited, per article)	+0.33pp	19 of 20

Once OPERS is measured on the correct, apples-to-apples defined-benefit-only basis, **its pattern is no longer the bidirectional, statistically random-looking result the article relies on to characterize STRS as an outlier.** It becomes a **persistent, mostly one-directional gap in 16 of 20 years—much closer to STRS’ pattern than the article’s own (blended) OPERS figures suggest.**

Two conclusions can be drawn from this, and they work together rather than against each other. First, this is additional evidence that the reported-vs-audited divergence documented in this article is **not unique to STRS** or to its compensation structure or any alleged manipulation of returns as it **also** appears, in similar directional form, in OPERS’ own defined benefit plan once measured correctly. This simply reflects the fact that OPERS, too, is running net cash negative, albeit to a smaller degree than STRS.

Second, this does **not** mean the two systems are identical and therefore valid comparators from which M&S can draw their stated conclusions. STRS’ larger and more persistent net cash outflow (Sections 2–3) remains a plausible reason the effect is more **magnified** at STRS (a 0.33pp average gap and a stronger 19-of-20 directional signal) than at OPERS’ defined benefit plan on its own (a 0.19pp average gap and a 16-of-20 signal). Both points stand:

1. The underlying phenomenon is common to both systems and largely mechanical, and
2. STRS’ own cash flow structure plausibly explains why it experiences a larger version of it.

What the article’s original framing appears to get wrong is treating OPERS’ **apparent** randomness as proof that STRS’ pattern is behavioral and likely deliberate—the **article’s comparison that produced that apparent randomness was never OPERS’ defined benefit plan against STRS’ defined benefit plan in the first place.**

We would flag one open item for further verification: we have not yet been able to confirm whether the article’s OPERS “audited” column is itself sourced from the defined-benefit-only GASB MWR schedule or from some other blend; in FY2022 it does not exactly match either the DB-only MWR (-12.1%) or the DB-only TWR (-12.03%) we located in the CAFR. Seeking resolution on this would allow the ability to have a corrected comparison above.

5. Gross-vs-Net-of-Fees: A Mismatch Baked Into the “Reported” Column

A separate and independent issue compounds the effects described above. STRS’ Management’s Discussion and Analysis reports both a **gross-of-fees** “Total Fund” return and a **net-of-fees** “Total Fund Net” return side by side for FY2022:

Metric	FY2022
“Total Fund” (gross of internal/external management fees)	-3.61%
“Total Fund Net” (net of all fees, carried interest, and fund expenses)	-3.73%

Source: STRS Ohio 2022 CAFR, Management’s Discussion and Analysis, “Investment Performance,” p. 12.

The gross figure, **-3.61%**, is an exact match to the article’s “Reported Rate of Return” for STRS in FY2022. We checked this against a second year to confirm the pattern: the CAFR’s investment-policy appendix shows an illustrative FY2021 “Total Fund” (gross) return of 29.28%—again an exact match to the article’s Table 1 figure for that year. **The article’s STRS “reported” column is STRS’ gross-of-fees, GIPS-verified TWR, not the net-of-fees figure STRS itself leads with in its own performance narrative.**

STRS discloses the magnitude of this fee drag directly, in its GIPS compliance notes: “the impact of fees on net return have ranged from **11 to 14 basis points per year over the past 10 years.**”

This matters because figures pulled from OPERS (M&S’ chosen comparator) CAFR documents **do not follow the same convention as used for STRS data.** OPERS’ Investment Section in its CAFR states explicitly: “All returns presented throughout the Investment Section are **net** of external manager fees, overdraft charges, debit interest, registration expenses, stamp duties, and taxes.” In other words, the figures listed in OPERS’ side of the article’s “reported” column are already net-of-fees, while the figures listed in STRS’s side are gross—a **fundamental data mismatch.**

The article is therefore not just comparing two systems with different cash flow structures (see sections 2–3 of this memo), it is comparing STRS’ **gross** return against OPERS’ **net** return, with both then measured against an audited MWR figure that is inherently net-of-fees (it reflects the dollars that actually landed in the fund). A gross-vs-net mismatch of this kind **mechanically inflates** the apparent STRS gap while leaving OPERS’ gap unaffected, independent of any cash-flow or behavioral explanation. Using STRS’ own disclosed 11–14 basis point fee drag, restating STRS’ “reported” figures on a net-of-fees basis—the same basis OPERS already uses—would shrink STRS’ average annual “overstatement” from 0.33 percentage points to roughly 0.19–0.22 percentage points, on top of (not instead of) the cash-flow-timing effect already discussed and documented above.

6. What Each Metric Tells the Plan Sponsor

Change in net fiduciary position (and the MWR derived from it) and the TWR are not two competing estimates of a single “true” number representing a fund trend, attribute, or result—they are **purpose-built to answer two different questions that a pension board legitimately needs answered:**

	Change in Net Fiduciary Position / Money-Weighted Return	Time-Weighted Return
Question Posed	“How did the actual dollar pool available to pay benefits change this year, given contributions, benefit payments, and investment results together?”	“How well did the investment program perform, independent of the sponsor’s own funding and benefit decisions?”
Primary use	Solvency and funding/contribution policy assessment; actuarial valuation; GASB 67 required disclosure	Manager/staff performance evaluation; benchmarking against peers and indices; compensation
Sensitive to cash-flow timing?	Yes—by design	No—deliberately neutralized

	Change in Net Fiduciary Position / Money-Weighted Return	Time-Weighted Return
Who controls the inputs?	Board and legislature (contribution rates/benefit policy), and demographics (benefit payments)	Investment staff and market conditions

This distinction matters directly for the article’s central governance claim. The article characterizes STRS’s use of a separate, non-MWR return figure for performance bonuses as maintaining “two sets of books” that enable rent extraction. “Rent extraction” in this case is a term used in economics to describe the use of governmental power to “extract” value in a given situation by any party capable of wielding or benefiting from that power. In this case it would be the power to choose reporting methods and create performance-based incentive compensation programs. But computing **both** a GASB-mandated MWR and a TWR is **standard, expected practice across public pension systems, precisely because a single number cannot answer both the solvency question and the investment performance question**. Using MWR to evaluate or compensate investment staff would arguably be (stated diplomatically) the **methodologically incorrect** choice, since it would reward or penalize staff for cash-flow timing decisions—contribution schedules, benefit payment volume—that are made by the board and legislature, not by investment staff. STRS’ use of a TWR-style figure for bonus purposes is consistent with standard industry practice for isolating investment skill from funding policy, not evidence of a deliberately manipulated shadow metric.

7. Implications of the FY2022 Concentration

The article’s quantitative results are disproportionally driven by a single year’s data, FY2022. Sometimes such unusual dependence on a single data point is valid, but in our experience, it always merits further investigation. In the article, the claimed 1.79 percentage point overstatement by STRS drives approximately \$1.57 billion of the \$9.3 billion cumulative figure—more than five times the twenty-year average annual gap, and, by the article’s own sensitivity analysis, is responsible for the difference between a \$3.2 billion and a \$9.3 billion headline total.

When reviewing STRS’ audited FY2022 GASB MWR against **two consecutive, separately published CAFRs** (FY2022 and FY2023), both report the identical figure, confirmed visually against the underlying bar chart exhibit on p. 36 of each report:

Source	FY2022 STRS Return
STRS FY2022 CAFR—audited GASB MWR	-3.55%

Source	FY2022 STRS Return
STRS FY2023 CAFR — audited GASB MWR (restated comparative)	-3.55% (unchanged)
Article Table 1 — “Audited”	-5.40%
Article Table 1 — “Reported”	-3.61%

STRS’ own audited figure, confirmed identically across two independent annual reports, is nearly indistinguishable from the article’s **“reported”** figure (a 0.06 percentage point gap, consistent with ordinary rounding)—**but not its so-called “audited” figure**, which is off by 1.85 percentage points—certainly a material difference in this context. There is no restatement between the two CAFRs that could explain this as a timing artifact. Upon review of official STRS actuarial documents, the reason for the discrepancy appears to be primarily driven by a difference in calculation methodology: the CAFR return reflects a true MWR calculation, whereas the purported “audited” return reflects a simplified actuarial gain (loss) return calculation, summarized below:

- Rate of Return = Net Investment Income / “Average Assets”
 - Where Average Assets = Beginning Assets + $\frac{1}{2}$ x Net Cash Flow.

The actuarial gain (loss) return calculation therefore represents a simplified average-assets approximation that can materially differ from a true MWR return calculation, particularly when combined with cash flow and market return dynamics. As this relates to FY2022 specifically, STRS was cash flow negative (as previously discussed), and investment performance was distinctly positive in the first half of the fiscal year, followed by a distinctly negative period. These variables mathematically yield a higher MWR result, as the MWR calculation places a greater weight on the first half of the year (i.e. more capital is “at work” as a result of the persistent cash outflows throughout the year) – as compared to the simplified actuarial “half-year” assumption.

The implications for the article’s conclusions are material:

- **Directional pattern:** the “19 of 20 years overstated” finding—the basis for the article’s $p < .0001$ statistical claim—would become 18 of 20 if FY2022 is corrected, a materially weaker and less extreme result, particularly once combined with the structural cash-flow, OPERS-comparison, and fee-basis explanations in Sections 2–5.
- **Magnitude:** correcting this single year would remove **roughly half of the article’s headline \$9.3 billion cumulative overstatement figure, per the authors’ own stated sensitivity analysis** (\$3.2 billion without FY2022), again prior to combining this with effects noted across our other findings.

- **Rhetorical weight:** FY2022 is the article’s most frequently cited and most dramatic single data point. Its apparent unreliability removes the anchor for the article’s most vivid framing.
- **Broader data reliability:** because this discrepancy is independently verifiable and does not hold up against primary sources, it raises a reasonable question about the reliability of the earlier portion of the twenty-year dataset (FY2003–FY2012), which we have not independently verified against primary-source CAFRs from that period.

Conclusion

Taken together, these findings suggest that a meaningful share of the divergence the article attributes to deliberate opportunistic behavior at STRS is better explained by:

- a) Routine and well-documented differences between MWR and TWR methodologies;
- b) A genuine, persistent, and quantifiable difference in cash-flow structure between STRS and OPERS that helps explain the difference in magnitude;
- c) A flawed OPERS comparison that blends in Health Care and Defined Contribution portfolio returns and thereby masks a similar underlying pattern in OPERS’ own defined benefit plan;
- d) A gross-vs-net-of-fees mismatch baked into the article’s “reported” column that structurally favors finding a larger gap at STRS than at OPERS; and
- e) An apparent methodology discrepancy between the audited MWRs and the M&S purported “Audited” returns, which is most evident in FY2022, the single most consequential year in the dataset. This is not to opine on STRS’ bonus structure, but the specific statistical case constructed in this article does not, on the evidence available, support the strength of its central claims, and the article’s central comparative device (STRS vs. an “unaffected” OPERS) does not hold up once each system’s defined benefit plan is measured on its own terms.

This memorandum is based on a review of the STRS Ohio FY2022 and FY2023 Comprehensive Annual Financial Reports, the OPERS 2022 Annual Comprehensive Financial Report, and Mendenhall & Sutter, “Retirement at Risk: The Political Economy of Public Pension Governance,” Journal of New Finance, Vol. 4, No. 1 (2026). We did not extend our analysis to the structure of the PBI (Performance Based Incentive) program at either system, as we did not see such extension critical to our review of the thesis and supporting analysis contained in the article we were asked to review. We did not “re-audit” either system’s CAFR data nor did we review M&S’ underlying data set as they did not make it available to the ORSC.