

To: The SEC  
From: Anonymous  
Re: Pension funds are over-stating their Private Equity performance which in turn overstates the performance of the Pension funds.

- 1) None of the pension funds break out PE performance in a way that reflects the money made by the underlying beneficiaries. It is always hidden and juiced by the credit line so the managers look good. Why don't they let you drill down? The idea that the ILPA can pick the top 20% of managers is a joke. If the Financial Advisors who manage money for the wealthiest individuals in the country said that, they would get laughed at and fired. Everyone reading this is aware of that.
- 2) The SEC has to step in and protect the beneficiaries. It is not their fault that their managers are conflicted.
- 3) NYState says on page 13 of the 2022 comprehensive report that they made 9.51%. However on page 92, they say the Private Equity portion made 37.57%. The 37.57% is fake. No one is making 37% in Private Equity. Walking on water is more likely. NYState and every Pension fund below is publishing a FAKE IRR number and pretending that it magically makes more money than the public markets. You get paid a lot to manage a complicated portfolio. You don't get paid much to Index.
  - a) [DiNapoli: State Pension Fund Posts 9.5% Annual Investment Return | Office of the New York State Comptroller](#)
  - b) If we assume NYState had 1 Billion on March 31, 2021, they don't have 1.37 Billion as of March 31, 2022. However, The 11.39% is what the NYState pension actually earned in domestic equities. That is actual money. They can sell that and give the money to firemen. The 37.57% doesn't correspond to a dollar amount. There is nothing to sell. It is fake. I will repeat that for effect. There is nothing to sell. It is fake.
  - c) The 37.57% is a "Pooled IRR". Someone on the NYState team has to take the IRR of each deal and combine them in some way to get 37.57%. You can see below in a recorded conversation how Apollo can't back up a "pooled IRR" number with nine of its own funds. I allege they are breaking FINRA 2210 (d) by selling a product with a number that they don't explain according to the audience. In Pension fund land, they are breaking the Golden Rule. (not actionable, unfortunately)
  - d) How does NYState create a "pooled IRR" number from over 100 funds, with approx 1500-2000 underlying deals to get 37.57% What assumptions are they using? What about the credit line? If it doesn't translate into an actual increase in how much the beneficiaries can spend, why is it used?
    - i) The State of Maryland has 232 Private Equity funds listed. (alphabetical order)
    - ii) I am assuming the State of New York is using only 100 funds with 1500-2000 underlying deals. It is probably closer to 200 funds.

<b>CALPERS-</b>	<b>They have a multiple of 1.5x .</b>	<b>Over 10-12 years, they will turn \$100 into \$150.</b>	<b>S&amp;P does 1.5x.</b>	<b>CALPERS is the best and only makes 1.5x.</b>	<b>Other states do better?</b>	
<b>State</b>	<b>Title of report</b>	<b>URL</b>	<b>3 Year IRR</b>	<b>Three Year dollar value if IRR was real-\$100 initially</b>	<b>5 year IRR</b>	<b>Five year dollar value if IRR was real-\$100 initially</b>
<b>Alabama</b>	Alabama Pension	<a href="http://rsa-al.gov">The Retirement Systems of Alabama (rsa-al.gov)</a>	9%	\$129.50	25.82%	\$315.32
<b>Alaska</b>	Hard to find					
<b>Arizona</b>	Hard to find					
<b>Arkansas</b>	Hard to find					
<b>California</b>	See CALPERS case study	<a href="#">Private Equity Program Fund Performance Review - CalPERS</a>				Calpers has a 1.5 multiple overall, so that means \$100 turns into \$150 over 10-12 years.
<b>Colorado</b>	Colorado PERA	<a href="https://www.copera.org">https://www.copera.org</a>	24.00%	\$190.66	19.30%	\$241.66
<b>Connecticut</b>						
<b>Delaware</b>	Delaware PERS	<a href="#">FY22AnnualReport.pdf (delaware.gov)</a>	24.80%	\$194.38	20.20%	\$250.91
<b>Florida</b>	Jan 2023 trustee performance report	<a href="https://www.sbafla.com/fsb">https://www.sbafla.com/fsb</a>	23.51%	\$188.41	20.38%	\$252.80

<b>Georgia</b>	Employees retirement system of Georgia	<a href="#">Employees' Retirement System of Georgia Annual Comprehensive Financial Report for the Fiscal Year Ended June 30, 2022</a>			25.50%	\$311.33
<b>Hawaii</b>	Hawaii ERS	<a href="#">ERS (ehawaii.gov)</a>	22.72%	\$184.82	20.36%	\$252.59
<b>Idaho</b>	Idaho PERSI	<a href="#">www.persi.idaho.gov/docs/investments</a>	23.20%	\$187.00	20.40%	\$253.01
<b>Illinois</b>	2021	<a href="#">https://pensions.ilinoisanswers.org</a>	26%	\$200.04	23.30%	\$284.98
<b>Indiana</b>	Indiana Public retirement system	<a href="#">https://www.in.gov/inprs/files/INPR_SAnnualReportBook2021.pdf</a>	22.10%	\$182.03	19.00%	\$238.64
<b>Iowa</b>	Hard to find					
<b>Kansas</b>	Hard to find					
<b>Kentucky</b>	Kentucky Pension- (They compare "IRR" to the Russell + 300 bps- they "beat" the benchmark)	<a href="#">www.kyret.ky.gov/Investments</a>	15.53%	\$154.20	14.20%	\$194.24
<b>Louisiana</b>	Hard to find					
<b>Maine</b>	Maine PERS	<a href="#">https://www.maineopers.org/wp-content/uploads/ACFR22.pdf</a>	25.90%	\$199.56	22.20%	\$272.49
<b>Maryland</b>	Maryland state pension system	<a href="#">https://sra.maryland.gov</a>	24.67%	\$193.77	21.38%	\$263.47
<b>Mass</b>	Pension reserves Investment trust fund 2021	These guys claim a 72.7% return of the prior 12 months- WOW!	28.80%	\$213.67	25.90%	\$316.32
<b>Michigan</b>	Hard to find					
<b>Minnesota</b>	Hard to find					
<b>Missouri</b>	Hard to find					
<b>Montana</b>	Hard to find					

<b>Nebraska</b>	Hard to find					
<b>Nevada</b>	Nevada PERS 12/31/22 Performance gross of fees	<a href="https://www.nvpe.rs.org/aboutus">https://www.nvpe rs.org/aboutus</a>	23.70%	\$189.28	21.40%	\$263.69
<b>New Hampshire</b>	Difficult					
<b>NJ</b>	NJ Investment report- 12/2022	<a href="#">INVESTMENT REPORTING PACKAGE</a>	16.46%	\$157.95	14.58%	\$197.49
<b>NY</b>	NYSLRS 2022 Annual report	<a href="#">Retirement   Office of the New York State Comptroller</a>			19.93%	\$248.11
<b>North Dakota</b>	North Dakota Pension funds	<a href="#">Annual Comprehensive Financial Report for year ending June 30, 2022</a>	19.66%	\$171.34	14.40%	\$195.94
<b>Ohio</b>	Hard to find					
<b>Oklahoma</b>	NO PRIVATE EQUITY- GO SOONERS!					
<b>Oregon</b>	Oregon PERS	<a href="#">2022-Annual-Co mprehensive-Fin ancial-Report.pdf (oregon.gov)</a>	21.86%	\$180.96	19.64%	\$245.12
<b>PA</b>	Penn. net of performance 9/30/22	<a href="#">PSERS</a>	20.40%	\$174.53	17.17%	\$220.84
<b>RI</b>						
<b>South Carolina</b>	2022	<a href="#">Popular Annual Financial Report</a>	20.52%	\$175.06	16.88%	\$218.12
<b>South Dakota</b>	Hard to Find					
<b>Tennessee</b>		<a href="#">2022TCRSRepor t Investment.pdf (tn.gov)</a>	31.54%	\$227.60	26.88%	\$328.83
<b>Texas</b>	Hard to Find					
<b>Utah</b>	Utah Retirement Systems	<a href="#">URS</a>	36.90%	\$256.57	29.37%	\$362.38
<b>Vermont</b>	Hard to Find					
<b>Virginia</b>	Virginia Pension	<a href="#">Virginia Retirement System</a>	25.50%	\$197.67	21.20%	\$261.52

<b>Washington</b>	Wash. state dept of retirement (They compare "IRR" to the Russell + 300 bps- they "beat" the benchmark)	<a href="#">2022 ACFR Document</a>	23.01%	\$186.13	19.51%	\$243.79
<b>West Virginia</b>	WV consolidated Report	<a href="https://www.wvretirement.com">https://www.wvretirement.com</a>	26.50%	\$202.43	24.30%	\$296.73
<b>Wisconsin</b>	Hard to Find					
<b>Wyoming</b>	Wyoming pension	<a href="#">ANNUAL COMPREHENSIVE FINANCIAL REPORT</a>	30.19%	\$220.66	24.06%	\$293.87

## How does Apollo get to 22%?

### Our Flagship Private Equity Funds Have Performed Well Over a Long Period of Time Across Market Cycles

(\$ millions)	Inception to June 30, 2022					
	Total Committed Capital	Net Committed Capital	Total Realized Proceeds	Estimated Remaining Value	Total Value	Q2 2022 Net IRR
Fund IX (2018)	\$24,729	\$14,099	\$6,770	\$20,209	\$26,979	27%
Fund VIII (2013)	\$18,377	\$15,973	\$19,616	\$8,673	\$28,289	10%
Fund VII (2008)	\$14,677	\$14,677	\$34,083	\$136	\$34,219	23%
Fund VI (2006)	\$10,136	\$10,136	\$21,135	\$2	\$21,136	8%
Fund V (2001)	\$3,742	\$3,742	\$12,721	\$2	\$12,723	38%
Fund IV (1998)	\$3,600	\$3,600	\$6,781	\$0	\$6,781	8%
Fund III (1995)	\$1,500	\$1,500	\$2,695	\$0	\$2,695	11%
Fund I, II & MA (1990/1992)	\$2,220	\$2,200	\$7,924	\$0	\$7,924	35%
<b>Total</b>	<b>\$78,980</b>	<b>\$65,946</b>	<b>\$111,723</b>	<b>\$29,022</b>	<b>\$140,745</b>	<b>22%</b>

*Top Quartile Performance in Private Equity Since Inception<sup>(1)</sup>*

**APOLLO**

Note: As of June 30, 2022. Past performance is not indicative of future results. Please refer to the beginning of this presentation for important information relating to performance and the end of this presentation for definitions of key terms. (1) As provided by ThomsonOne, net IRR across applicable vintages for U.S. buyouts as of Q1 2022 (latest data available). Past performance is not indicative nor a guarantee of future results. Please refer to the Schedules of Investments at the end of this presentation for additional performance detail.

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## Apollo 22% 4/18/23

Operator: You are in the meeting now. There are two participants in the meeting. You are muted. You can mute or unmute yourself by pressing star six.

Operator: You are unmuted.

PE A: Hello.

Advisor: Hey PE.A.

PE.A: Yeah. Yeah, it's Me here and I've got PE.B

PE.B Hi Advisor

Advisor: Okay. Who am I speaking to?

PE.B .It's me, A Wharton MBA from the Apollo product group

PE. B I work as a product specialist on the private Equity team at PE FIRM and we work with PE.A .

This is my second call with Apollo. The wholesaler couldn't figure out how they got to the 22% so I asked him to get me on with the product specialist who had ample time to prepare. The product specialist has about 10 years of industry experience and is a Wharton MBA.

Advisor Fine. are you located in New York?

PE.B : Yes, I'm based in New York.

PA.A You had requested just to quickly discuss our IRR calculation. So PE.B is going to walk us through. You know how we get that 22% IRR.

Advisor: There were eight, eight funds? .

PE.B Nine funds we have.

Advisor: Correct. Nine funds? [crosstalk]

PE.A Nine funds. Yes.

Advisor: Okay. One second here. Okay. Nine.. if I get stuck I'm going to pull it up but nine funds. And I think if you add it up, it went to 20% but you guys had something 22%. Correct?

If you add it up, you get  $160/9=17.77$ . They have 22% as the IRR. They don't define it and it is not footnoted. It seems like they think everyone should just trust them. FINRA 2210 (d) states you have to explain things so the audience understands them and you can't use footnotes.

PE.A What? How are you adding? What are the numbers that you're adding together?

Advisor: I think if we added up all those funds and divided by nine, we got to 20. Is that correct?

PE.B So, so the way that IRR calculated, it's not like an average?

I know that. I am playing dumb.

Advisor: Just give, give, and just give me a minute to find a piece of paper. I had it here somewhere. So I can look at it.

PE.A Yes. I know you don't have the slide in front of you. I could pull it up if we need it. But you're just looking at the slide that lists the IRR of all our funds. [(4:00)] But what you were doing was I think adding them all together and then dividing by nine, which is not the correct way to get to the calculation of the 22%. So, I mean, PE.B feel free to, you know, take over,

PE.B : Yes.

PE.A And let him know just exactly how we're going to get that calculation.

The wholesaler is on board. He tells the product specialist to tell me exactly how they got to the 22%. He knows that when you are selling a locked up product with the promise of a high return, you sure as better know how you got to the high return number that you have on the pitchbook. He is selling this every day and that is the number he is using.

Advisor: Take nine funds, it will be 160 divided by 9,

PE.B But the IRR is not calculated by dividing. You, you don't divide it by the number of funds. It's basically a measure of cash flow. So it really is an aggregation of all the cash flows that all of our funds since inception have done. And so it's a pretty complicated formula. That's, you're not going to get to it by just adding and dividing because it also takes into account the time value of money. So it's really looking at all the cash flows from all of our funds since inception and aggregating those. And then deducting fees, carried interest and all the relevant expenses to get to the net IRR figure.

Since it is a "pretty complicated formula", they really need to explain it in order to comply with FINRA 2210 (d). However, since she calculates this formula every quarter, she should be able to explain it. She can't. The wholesaler also said it is a complicated formula. When both the wholesaler and the product specialist are telling you the number is complicated, the customer is in trouble.

Advisor: So there were nine funds. Correct?

PE.B: Yes, but that doesn't really matter the number of funds. It's really based on all the cash flows that are behind those funds.

Advisor: So Is it the individual deals inside those funds, is that what you're looking at? [crosstalk]

PE.B: Exactly. Yes, that's correct.

Advisor: So how many deals..

PE.B: So that we can find..

Advisor: Oops, oops, oops. Slow down. slow down. How many deals inside the funds are there?

PE.B: There's usually 25 to 30 companies per fund.



Advisor: okay. So, if we say...

PE.B: But again, adding...

(She is speeding up because I think she realizes that I am going to be asking specific questions that she can't answer)

Advisor: One sec, one second. you are going to fast for me, 9 times 25 would be 225 deals inside that number. Correct?

PE.B: Um, that's an approximation, it's like 27 in fund nine for example. So I would say it's in that [(6:00)] ballpark. In our earlier funds, we had fewer deals. So, it's..

Advisor: Gotcha.

PE.B: ..it's not scientifically like 25 times 9.

Advisor: But, it's 200, 250. It's not six and it's not 5,000, something like that. Right?

The 22% comes from some combination of the 200 individual deals inside the 9 funds. Some deals did well, some did poorly. Some are still active. Some are using the credit line. How exactly are they weighting each of the 200 deals to get to 22%.

PE.B: Right, right. in that ballpark.

Advisor: Okay. And then how.. So, how do you get to the 22%? PE.A said to me one time, it's coming back to me now, you market cap weight them??

She says they don't market cap weight them. However, a few minutes later, she changes her mind and says they do market cap weight them. Of course they do, it makes no sense otherwise and this is the product specialist who was brought on specifically to explain this number. If she is calculating the numbers every quarter, a crucial- maybe the most crucial- assumption is the market-cap weight. When companies report earnings they have to list the assumptions they are making and they have to list which assumptions are important. This is certainly a really important assumption and she has no idea.

PE.B: No. So it's all the cash flows. And so if we look up on fund nine for example, there are twenty seven companies. Each company has their cash flows based on invested capital and proceeds. So basically cash in and out of the companies. And then if we aggregate that on the fund level for all the portfolio companies and their income and invested capital, we get different cash flow on different dates. So every quarter in the beginning, the cash flows are going out to fund the growth of the company. And then in the later stages of the investment period, you're getting cash flow back from those companies as they exit. So every quarter we get cash flows in and out to get a net cash flow for that period. And then at the end of the period, you take from that gross cash flow, you deduct out management fees, expenses, etc. And then you get the net cash flow. And then you run an IRR calculation on those cash flows to get the IRR.

A huge problem with this is the credit line. If they borrow on Jan 1 and only ask for client money on December 1 and return the client money on December 31st, they have artificially manipulated the IRR by borrowing. How do they account for that?

Advisor: So let's, let's say last month or last quarter of January to December 30th. There were 225 just to make a number. But..

PE. B 225, what?

Advisor: 225 different deals that you're looking at having cash flows that are coming in and out. Correct?

PE. B Well, right now, all the earlier funds are fully realized. So the only deals that are generating cash flows still, are only in funds eight and nine, really. [(8:00)] So it's really two active funds that still have cash flow movements because fund seven and before those deals are fully realized. We're not in those companies. We've gotten our money back from that.

Advisor: Aha.

PE.B: So those numbers are not impacting quarter to quarter.

Advisor: Okay. so You have 25 deals or 50 deals, let's say. In these two funds, 25, 50 deals. Correct?

PE. B: Um, , 25 to 35? Yeah.

Advisor: Let's say 35. There are two funds left with 35 active deals. So this last quarter, you used some weighting on those 35 deals and some weighting for the prior seven funds of those completed deals, right? So let's assume there were 150 deals or let's say it's 170 deals. I'll make a number. 200 deals total, it will just be easier that way. So you're saying there are 30 or 35 deals still active, which means 170 deals were prior to that. Correct?

If we have 170 completed deals and those were smaller funds, we now have 35 deals which are much larger in size than the 170 completed deals. The two most recent funds with active deals are 44 Billion in size. The new deals are making much more use of the credit line. The prior 170 deals (in the prior 7 funds) are 33 Billion in size. You have to weight the 35 current deals more than the prior 170 deals to make the market cap fair.

PE. B : Yes

Advisor: So of those 170 completed deals, and 30 active deals, you have to measure the IRRs. You have to weight each of those a certain amount, correct? Meaning if it was 100 deals at 1% each, you would then have a very simple calculation. With 200 deals at 50 basis points, you know, you would have a different calculation but still kind of simple. So, how do you weight those numbers to get 22%?

PE. B It's, um, weighting is kind of more of an average or weighted average concept. The IRR is basically, a calculation that takes all the cash flows. And then uses the time value of money to derive a return. So as an example, if I take a \$100 from you, and then tomorrow, I give you 200. That's a really high IRR because you're getting your money back immediately. Whereas, if I take 100 from you and then 10 years down the road, then I give you 200, then [(10:00)] your IRR is going to be a lot lower than if I give you back all of your money immediately. It's really on a company level. You're looking at how much money you're taking and when you are giving it back. So, once the company is fully realized, the IRR doesn't change because you have gotten your money back. But all those factors kind of flow into the final IRR of our strategy. But it's not so much a weighting of this company, it may be weighted higher because it's lower in terms of timeframe. Once the IRR is fully realized, it doesn't really change.

She is great at defining IRR but doesn't explain what she is there for, which is to tell me how the IRR of the 200 deals combines to get to 22%.

Advisor: Okay. So, I think I understand that. But I'm still trying to get, if, if there are 170 companies that are totally done.

PE.B: Mmm.

Advisor: And a long time ago, the funds were small and they only did five deals. I mean, the funds now are much bigger, how much is the recent one?

PE. B: 25 billion is our most recent fund.

Advisor: 25 billion. So..

PE. B So yeah, I guess that's a good point. In the past, it was a few \$100,000,000 million. (now its 25 billion) Larger investments do have a greater impact on IRR. So, there is the component of size. So for any larger deals that did extremely well or really poorly that would skew the IRR of the overall fund.

Just like I said, of course you have to market cap weight it. Of course it is a good point. Isn't she using the market cap weight each quarter to calculate the 22%? The most recent funds are more heavily weighted. Doesn't she know how this number is calculated. It is the most important number on the pitchbook. The most recent deals are also using the credit line more. So they are totally skewing the IRR to a false positive.

Advisor: Well, I see, so there is some market cap weighting. So if you have 200 deals total. And the most recent deal, I'm simply making up a number here to express a point,. If the most recent deals were five times the size. You'd have to weight the most recent deals at Five times the size of the of the prior deals to make it like a fair comparison. Correct?

PE. B: Um, Sorry say that again?

Advisor: I'm saying, in the very beginning that the funds were smaller. But, you said the current fund is a 25 billion dollar fund, if the deals are bigger, that would skew the IRR in favor of a large deal.? You know, if you did really good or really bad with A [(12:00)] recent deal, that would skew the average because there is a market cap weighting . Is that right? Or wrong?

PE. B That would impact it definitely. But there are a number of factors that impact the IRR, including the timing of the cash flows. So one of the factors is the size of the transactions but that's one of the many factors that drives the IRR.

Just above she said the size of the transaction didn't matter and now she is saying the size of the transaction does matter. .

Advisor: Okay, well, Let's assume that the deal today has an IRR of 25%. With a lot of money. And let's say a deal in the first fund, had a return of 10%. Or we can reverse it, we can say A deal today had an IRR of 10% and deal back had an IRR of 25%? How do you weight the 25% and the 10% to get this 22% at the bottom of the column? I know there's some calculation to make an IRR for each deal. Let's say we agree on that

number. You bought a widget and you sold the widget. And you got the money back kind of quickly and you made 25% today. But a long time ago, you bought a widget and sold a widget and you only made 10%. But that was a long time ago with a small amount of money and today it's a lot of money. Those two numbers are part of the 200 deals in the calculation. How do you weight those two numbers to get this 22 percent?

PE. B: [(14:00)] It's, it's weighted using the IRR formula which is by taking all the cash flows and then discounting those cash flows and aggregating that. (She realizes we are at an impasse and she is repeating herself and can't answer the question-but she says she is about to send me the file so I back off a bit as I want to get the file. ) I can show you our cash flow file which shows the formula. But not, it's not like an adding or dividing type of situation because it takes into account the timing of the cash flows. And then, it's basically a cash flow over 1+ the IRR over a time exponential Quantum. So it's, it's like, it's not very straight forward to just say, since this is from five years ago. So, it's worth like one-fifth the amount of the other one. it's a Nuanced calculation.

(whenever you hear it is a “nuanced” calculation, investors are headed for trouble- this is now a “complicated” and a “nuanced” calculation)

Advisor: What if on the other hand, a fund, a long time ago made 25% IRR and a fund today made a 10% IRR. How would the Nuance work with that?

PE. B: They would both be taken into consideration for the final calculation. But it really depends on the timing of the fund.

(Again, what is she talking about- how do they put a number with no backup on a pitchbook)

Advisor : What does that mean?

PE.B: It's basically taking every single cash flow that we have had in the deals and all the funds. And aggregating them together. So it would be like if you had a really long fund from 1990 until 2022. So, it's basically pretending all the deals add up to one fund, if that makes sense.

Advisor: It sort of does, but I have been in alot of these funds and they overlap each other. Do you understand what I am saying. [(16:00)]

PE. B: They do, Yes, .

Advisor: ..then it is really not fair to say it is one big fund because some of the old funds start and they take six, seven years even 10 years to work out. But since you start a new fund just three or four years later? So what does that mean that it is all one fund?

She has no clue. These deals and funds overlap. There is no such thing as a great big fund from 1990 until 2022.

PE. A It all has to do with the cash flow. So when the money is coming in and out of each individual deal. And then that 22% is just taking into account, when you go all the way back to fund one.

The original wholesaler realizing that his product specialist is having trouble is coming in to try and save the day.

Advisor: I get the principle. I just feel like it just falls apart. I mean, I get the idea but really, really if there's 200 individual deals in there, right?

PE. B Um, yeah.

Advisor: Okay. Fine. If there's 200 deals and only 30 are active right now, so 170 of those deals are totally done. Correct? So whatever the IRRs is on those completed funds is totally done ?

PE.B: Yeah, yes.

Advisor: So those 170 funds are given some weighting in the total weighting. There are only 30 funds left. And there are 200 funds total. When you do a market cap weighting for regular stuff. You know, so the weightings get to 100, you say it is 20% times this plus 20% times that plus 20% from a third and so on and then you get a number at the bottom. And that's the market cap weighting. It's simple. This feels to me like it's sort of like that but not really.

(What I am saying is 7th grade math and she doesn't understand it)

PE.B: I'm, I'm not sure what you mean, by it feels like that, but not really.

Advisor: Do you have a spreadsheet that gets that 22% number?

PE.B: We do have a backup. I can give you a, [(18:00)] cash flow synopsis that we can send you. Sure.

Advisor: It'll, it'll show the 200 funds and they get to the 22%..??

PE.B: That might be the easiest.

Advisor: .. and gets to the 22%?

PE.B: It will show all of our funds since inception and the cash flows for each of those funds. And the IRR for each of those. Both on the deal level and on a fund level.

The numbers for the IRR for each deal for the active deals are artificially high because of the credit line. They are also over 50% of the market cap weight. The whole thing falls apart when you ask how they weight each individual deal. However, if she is going to send it to me, terrific.

Advisor: .. You are market cap weighting all of the deals and changing the new deals as they change and the old deals are constant? If you have a spreadsheet that supports what you are saying and that shows all the confidence factors? It spells out how you get to the 22? Well, then you have a spreadsheet. It is just not on the piece of paper on the pitchbook.. you know what I mean?

PE.B: Yeah, I think the cash flows will help you. It's basically any deals that are realized are just not generating more cash flow.

Advisor: No. I get that. If you have a backup, that is fine.

PE.B: Yes, we have a backup that we can send.

Advisor: Okay. Great. That would be great. I'm just, I'm just curious how that works. I won't send it to any clients. Whenever I can't get to a number, I'm always concerned about showing it to somebody else. And then they ask me how you got to that number. And I am in trouble if there is no back up for it.

PE. B Right. Sure. Yeah. We definitely have a backup. So we can send that, that might help.

Advisor: Okay. Great. Okay. why don't you send me that when you have a chance.

PE.A: Okay.

Advisor: Hey, PE.A, Do me a favor. Give me one sec. I wanna call somebody. Give me five, I'm coming right back. Okay?

PE.A: Okay. Got you. I'll give you a call a little...

Advisor: Give me five, give me five minutes. Bye. Bye.

[END]

Again, FINRA 2210 (d) says you have to explain things according to the audience and you can't use footnotes. They can't even explain the number according to themselves. The product specialist who is a Wharton MBA and was called in to explain a number that she is calculating every quarter has no idea how they got that number. She is making basic conceptual mistakes in explaining how they got the number. They are simply violating the industry rules of selling securities. This fund is being sold at Goldman Sachs, Merrill Lynch and numerous other "reputable" places.

----- Forwarded message -----

From: Wholesaler@apollo.com>  
Date: Wed, Apr 19, 2023 at 4:41 PM  
Subject: Apollo PE X Cash Flows  
To: Financial Advisor and FA.com>

Hi Financial Advisor

Sorry for the delay in reaching out.

After connecting with our PE Team, we are unable to disclosure and send out the Cash flows per our compliance.

Sorry for the miscommunication.

Best,

Apollo Global Management

Wholesaler@apollo.com

**How do we get to the 22%. I am calling that the “Pooled IRR”.**  
**Let’s look at the chart below.**

**210 deals each with A specific IRR.**

We are assuming 210 deals over 9 funds. The original 169 deals which had a total market cap of 33 Billion are totally done. The current deals from 170-210 are still active and have a total market cap of 44 Billion. Additionally, the current deals are making much more use of the credit line than the prior deals.

The active deals are 44 Billion. The completed deals are 33 Billion. Total deals 77 Billion. Active deals are 57%. Completed deals are 43%.

We need to market cap weight each deal on its own, but in general the 40 active deals are 57% of the “Pooled IRR” and the 170 completed deals are 43% of the “pooled IRR”. However, in general the active deals have less credibility as they are using the credit line to generate an artificially high IRR.

Each of the 210 deals has a specific IRR. Many of the IRR’s of the active deals are artificially high because of the credit line.

If we had 5 deals and each deal was the same size and each had an IRR of 10%, we could get a pooled IRR by doing the following.

<b>Deal</b>	<b>IRR</b>	<b>Weighting</b>
1	10%	20%
2	10%	20%
3	10%	20%
4	10%	20%
5	10%	20%
<b>Pooled IRR</b>	<b>10%</b>	<b>100%</b>

However, now we have 210 deals, each with different IRR’s, each of different sizes, and the active deals have less credibility because the IRR is artificially high because of the credit line.

How do you get to a number which represents the Program IRR with any sense of reality?

- 1) If each deal was equally weighted, it would be .47% per deal.
- 2) If we market cap weight:
  - a) 50% to the completed 170 deals and 50% to the 40 active deals:

- i) The 170 completed deals get a weighting of .29% per deal and the 40 active deals get a weighting of 1.25% per deal.
- ii) However, the 170 completed deals are not all the same size. The 40 active deals are not all the same size. Who exactly weighted those deals to come up with 22%? What assumptions did they use?

**Summary:**

**The 22% is a made up number.**

You can't combine deals this way. The only way to look at them is to see them on a month by month chart over multiple years and eyeball them. Some do good. Some do bad. They don't beat the public markets.

If these guys really had a way to hit consistent triples and home-runs, they would show us. They don't. That is why they hide the returns.



Deal	IRR	Deal	IRR	Deal	IRR	Deal	IRR	Deal	IRR	Deal	IRR	Deal	IRR
1	10.00%	31	10.00%	61	10.00%	91	10.00%	121	10.00%	151	10.00%	181	10.00%
2	2.00%	32	2.00%	62	2.00%	92	2.00%	122	2.00%	152	2.00%	182	2.00%
3	22.00%	33	22.00%	63	22.00%	93	22.00%	123	22.00%	153	22.00%	183	22.00%
4	13.00%	34	13.00%	64	13.00%	94	13.00%	124	13.00%	154	13.00%	184	13.00%
5	-23.00%	35	-23.00%	65	-23.00%	95	-23.00%	125	-23.00%	155	-23.00%	185	-23.00%
6	15.00%	36	15.00%	66	-2.00%	96	15.00%	126	15.00%	156	15.00%	186	15.00%
7	16.00%	37	16.00%	67	35.00%	97	16.00%	127	25.00%	157	16.00%	187	16.00%
8	34.00%	38	34.00%	68	34.00%	98	34.00%	128	15.00%	158	34.00%	188	34.00%
9	20.00%	39	20.00%	69	20.00%	99	20.00%	129	20.00%	159	20.00%	189	20.00%
10	-8.00%	40	-8.00%	70	-8.00%	100	-8.00%	130	-8.00%	160	-8.00%	190	-8.00%
11	31.00%	41	31.00%	71	31.00%	101	31.00%	131	31.00%	161	31.00%	191	31.00%
12	20.00%	42	20.00%	72	20.00%	102	20.00%	132	20.00%	162	20.00%	192	20.00%
13	5.00%	43	5.00%	73	5.00%	103	5.00%	133	5.00%	163	5.00%	193	5.00%
14	5.00%	44	5.00%	74	5.00%	104	5.00%	134	5.00%	164	5.00%	194	5.00%
15	23.00%	45	23.00%	75	23.00%	105	23.00%	135	18.00%	165	23.00%	195	23.00%
16	10.00%	46	10.00%	76	34.00%	106	10.00%	136	23.00%	166	10.00%	196	10.00%
17	2.00%	47	2.00%	77	2.00%	107	2.00%	137	2.00%	167	2.00%	197	2.00%
18	22.00%	48	22.00%	78	22.00%	108	22.00%	138	22.00%	168	22.00%	198	22.00%
19	13.00%	49	13.00%	79	13.00%	109	13.00%	139	13.00%	169	13.00%	199	13.00%
20	-23.00%	50	-23.00%	80	-23.00%	110	-23.00%	140	-23.00%	170	-23.00%	200	-23.00%
21	15.00%	51	15.00%	81	15.00%	111	5.00%	141	15.00%	171	15.00%	201	15.00%
22	22.00%	52	16.00%	82	16.00%	112	16.00%	142	16.00%	172	-3.00%	202	16.00%
23	34.00%	53	4.00%	83	34.00%	113	34.00%	143	6.00%	173	34.00%	203	34.00%
24	20.00%	54	20.00%	84	20.00%	114	20.00%	144	20.00%	174	20.00%	204	20.00%
25	-8.00%	55	-8.00%	85	-8.00%	115	-8.00%	145	-8.00%	175	-8.00%	205	-8.00%
26	31.00%	56	31.00%	86	31.00%	116	31.00%	146	31.00%	176	31.00%	206	31.00%
27	20.00%	57	20.00%	87	20.00%	117	20.00%	147	18.00%	177	17.00%	207	20.00%
28	5.00%	58	5.00%	88	5.00%	118	43.00%	148	5.00%	178	22.00%	208	5.00%
29	5.00%	59	5.00%	89	5.00%	119	5.00%	149	5.00%	179	5.00%	209	5.00%
30	-3.00%	60	-3.00%	90	-3.00%	120	-3.00%	150	-3.00%	180	-3.00%	210	-3.00%

# TEACHERS RETIREMENT OF ALABAMA

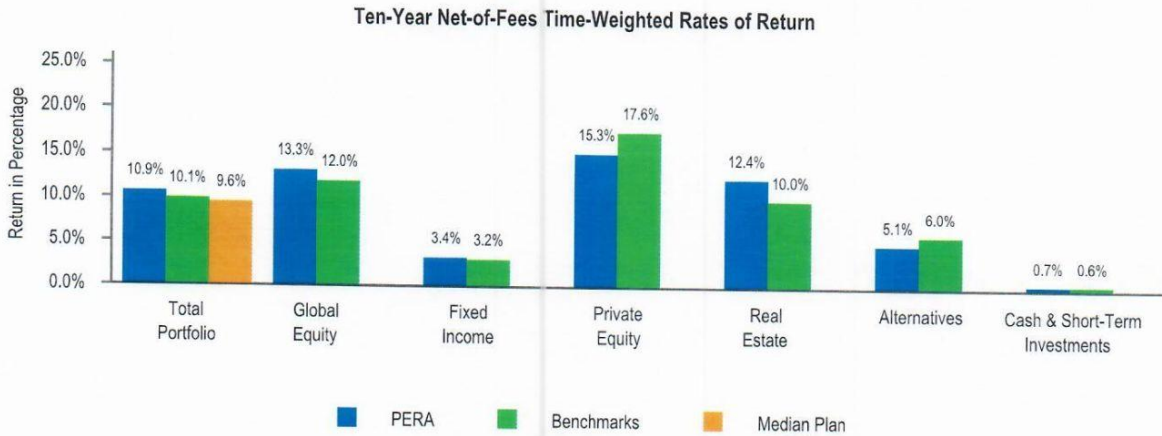
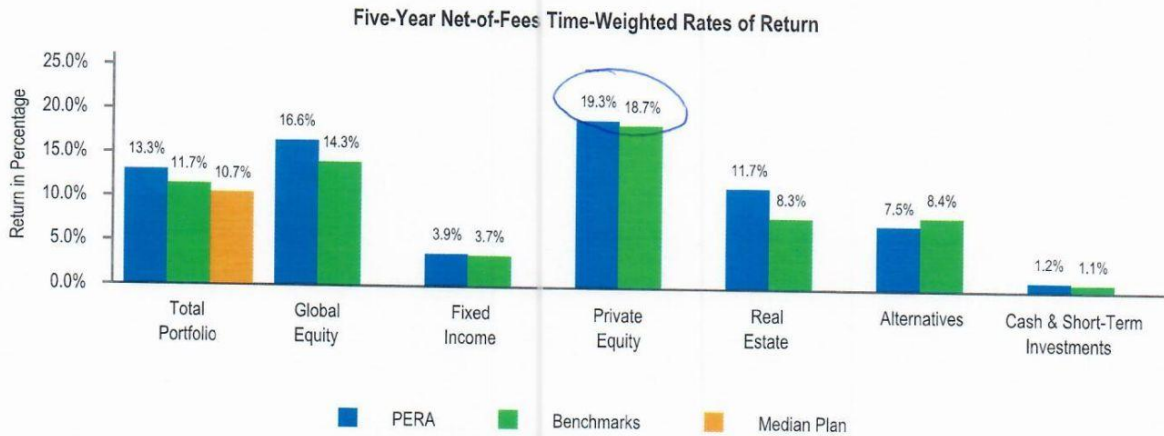
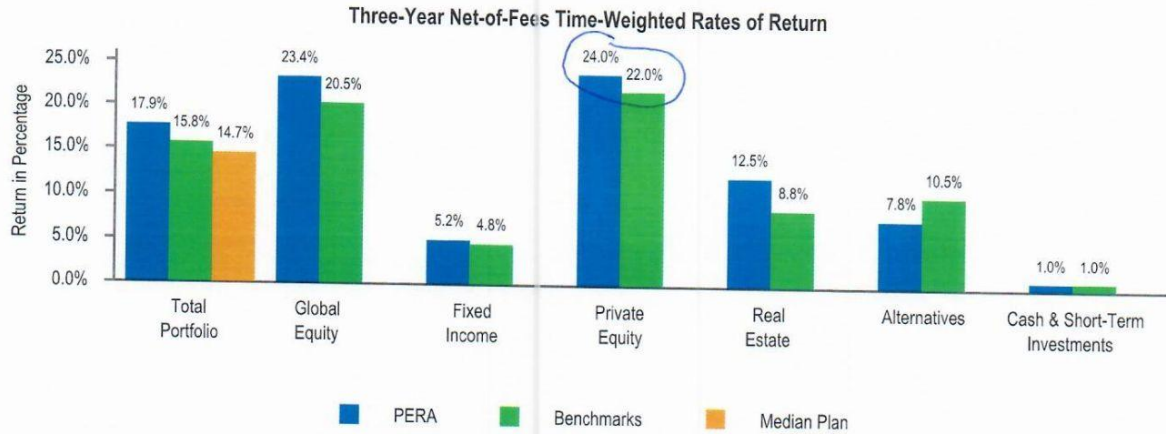
SUMMARY OF PERFORMANCE  
 RATES OF RETURN - Total  
 PERIODS ENDING September 30, 2021



RATES OF RETURN - GROSS OF FEES											
	NAV	1 Month	3 Months	CYTD	FYTD	1 Year	2 Years	3 Years	5 Years	10 Years	Incept. Date
TRS TOTAL GLOBAL EQUITY	20,674,372,751	-3.63	-0.73	13.61	31.61	31.61	18.79	12.62	14.06	14.10	Oct-75
TRS CUSTOM GLOBAL EQUITY INDEX		-4.06	-0.65	13.93	32.17	32.17	19.73	13.16	14.43	14.40	Jan-94
<b>FIXED INCOME</b>											
TRS TOTAL FIXED	3,132,687,446	-0.75	0.15	-1.04	0.09	0.09	3.94	5.77	3.49	3.71	Oct-03
TRS CUSTOM GLOBAL FIXED INDEX		-0.90	0.05	-1.48	-0.14	-0.14	3.67	6.01	3.45	3.54	Jan-90
Barclays Aggregate Bond		-0.87	0.05	-1.55	-0.90	-0.90	2.97	5.36	2.94	3.01	Jan-76
<b>ALTERNATIVE INVESTMENTS</b>											
TRS PRIVATE PLACEMENTS	487,763,307	2.53	3.51	7.58	8.62	8.62	8.21	5.88	-3.29	4.52	Oct-03
TRS PREFERRED AND PRIVATE EQUITY	1,497,045,790	14.51	14.60	26.71	26.97	26.97	11.36	9.01	25.82	20.17	Sep-03
TRS PRIVATE PLACEMENT AND PRIVATE EQUITY	1,984,809,087	11.33	11.68	21.20	23.19	23.19	10.21	7.94	5.00	9.04	Feb-04
TRS REAL ESTATE	2,394,131,528	2.44	2.44	2.45	2.45	2.45	-0.55	0.53	1.29	3.41	Oct-03
TRS PUBLIC REAL ESTATE	362,362,143	-6.50	0.54	24.17							Dec-20
TRS TOTAL REAL ESTATE	2,756,493,671	1.16	2.18	4.89	4.93	4.93	0.64	1.33	1.77	3.66	Oct-03
TRS TOTAL ALTERNATIVES	4,741,302,758	5.20	5.97	11.20	11.94	11.94	4.37	4.01	3.01	6.40	Oct-04
TRS TOTAL F.I. PLUS ALTERNATIVES	7,873,990,204	2.76	3.59	6.05	6.98	6.98	4.46	4.92	3.36	5.32	Oct-93
<b>CASH</b>											
TRS CASH ACCOUNT	504,745,309	0.00	0.01	0.05	0.10	0.10	0.58	1.20	1.23	0.71	Sep-03
TRS INTERNALLY MANAGED CASH	1,197,503,475	0.01	0.04	0.15	0.20	0.20	0.92	1.51	1.53	1.00	Oct-03
TRS 415 ESCROW	1,453,997	0.00	0.01	0.05	0.07	0.07	0.54	1.17			Apr-18
TRS TOTAL CASH	1,703,702,781	0.01	0.03	0.12	0.17	0.17	0.76	1.36	1.41		Oct-14

DEFINED BENEFIT PLANS

Listed below are the three-, five-, and 10-year net-of-fees time-weighted rates of return for the total fund and each asset class and their respective benchmarks.



OE

## Comparative Investment Results

(time-weighted rate of return)

	1 Year	3 Year	5 Year	10 Year
<b>Domestic Equities<sup>(1)</sup></b>	<b>(12.4%)</b>	<b>11.3%</b>	<b>11.6%</b>	<b>12.2%</b>
S&P 500	(10.6%)	10.6%	11.3%	13.0%
Russell 3000 Index	(13.9%)	9.8%	10.6%	12.6%
<b>International Equities<sup>(2)</sup></b>	<b>(26.7%)</b>	<b>3.5%</b>	<b>3.4%</b>	<b>5.8%</b>
MSCI All Country World Index ex-US	(19.4%)	1.4%	2.5%	4.8%
<b>Total Equities</b>	<b>(17.4%)</b>	<b>8.7%</b>	<b>8.6%</b>	<b>10.1%</b>
Equity Section Benchmark <sup>(3)</sup>	(15.9%)	6.9%	7.8%	9.9%
<b>Fixed Income &amp; Cash</b>	<b>(6.6%)</b>	<b>0.4%</b>	<b>1.7%</b>	<b>2.3%</b>
Fixed Income Section Benchmark <sup>(4)</sup>	(9.8%)	(0.7%)	1.1%	1.8%
<b>Alternative Strategies<sup>(5)</sup></b>	<b>(12.9%)</b>	<b>24.8%</b>	<b>20.2%</b>	<b>14.2%</b>
Policy Benchmark <sup>(6)</sup>	(14.0%)	4.4%	5.5%	6.8%
<b>Total System</b>	<b>(13.4%)</b>	<b>9.6%</b>	<b>8.8%</b>	<b>8.6%</b>
Policy Benchmark <sup>(6)</sup>	(14.0%)	4.4%	5.5%	6.8%
<b>Delaware Volunteer Firemen's Fund<sup>(7)</sup></b>	<b>(13.9%)</b>	<b>3.7%</b>	<b>5.0%</b>	<b>6.4%</b>
VFF Benchmark <sup>(8)</sup>	(14.1%)	3.6%	5.0%	6.4%
<b>Consumer Price Index</b>	<b>9.1%</b>	<b>5.0%</b>	<b>3.9%</b>	<b>2.6%</b>

(1) Includes domestic convertible securities and the domestic portion of global accounts.

(2) Includes international convertible securities the international portion of global accounts.

(3) 65.7% Russell 3000, 34.3% MSCIACWI ex US (Net).

(4) 90% Barclays Universal, 10% 90-Day TBills.

(5) Includes Private Equity and other non-marketable investments. All returns are on a lagged basis, with the exception of quarters ended 6/30/2020, 6/30/2021, and 6/30/2022.

(6) From Mar 1, 2021: 46% Russell 3000, 24% MSCIACWI ex-US IMI (Net), 27% Bloomberg Barclay's Universal, 3% 90-day TBills.  
02/28/2021 to 12/01/2020: 43% Russell 3000, 23% MSCIACWI ex-US IMI (Net), 31% Bloomberg Barclay's Universal, 3% 90-day TBills.  
11/30/2020 to 09/01/2020: 40% Russell 3000, 22% MSCIACWI ex-US IMI (Net), 35% Bloomberg Barclay's Universal, 3% 90-day TBills.  
08/31/2020 to 07/01/2019: 38% Russell 3000, 20% MSCIACWI ex-US (Net), 39% Bloomberg Barclay's Universal, 3% 90-day TBills.  
06/30/2019 to 07/01/2018: 38% Russell 3000, 20% MSCIACWI ex-US (Net), 40% Bloomberg Barclay's Universal, 2% 90-day TBills.  
06/30/2018 to 07/01/2006: 38% Russell 3000, 20% MSCIACWI ex-US (Net), 38.5% Bloomberg Barclay's Universal, 1.5% BBTIPS, 2% 90-day TBills.  
06/30/2006 to 8/1/1997: 45% Russell 3000, 10% MSCI EAFE, 43% Bloomberg Barclay's Aggregate and 2% TBills.

(7) Delaware Volunteer Firemen's Fund investments are invested separately from the other plans of DPERS.

(8) From 01/01/22: 46% Russell 3000, 24% MSCIACWI ex US IMI (Net), 28% Bloomberg Aggregate, 2% 90-day TBills.  
10/01/21 to 12/31/21: 43.33% Russell 3000, 22.67% MSCIACWI ex US IMI (Net), 32% Bloomberg Aggregate, 2% 90-day TBills.  
07/01/21 to 09/30/21: 40.67% Russell 3000, 21.33% MSCIACWI ex US IMI (Net), 36% Bloomberg Aggregate, 2% 90-day TBills.  
Prior to 06/30/21: 38% Russell 3000, 20% MSCIACWI ex US (Net), 40% Bloomberg Aggregate, 2% 90-day TBills.

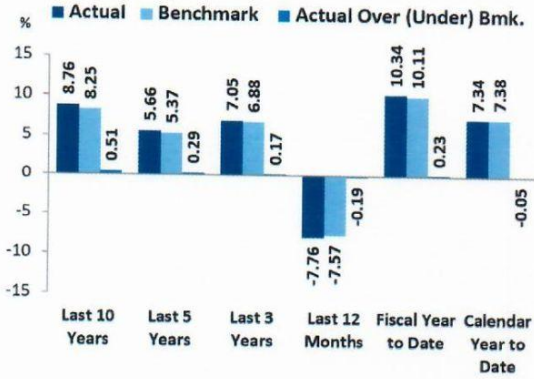


# Performance Report

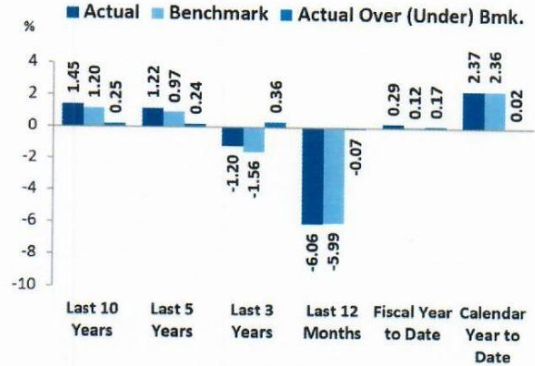
*Month Ending: January 31, 2023*

### C. Pension Plan Asset Class Performance Charts

#### GLOBAL EQUITY PERFORMANCE



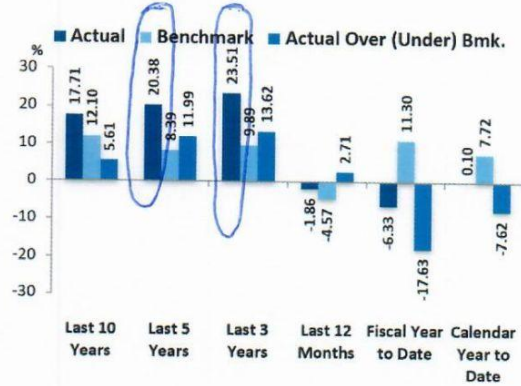
#### FIXED INCOME PERFORMANCE



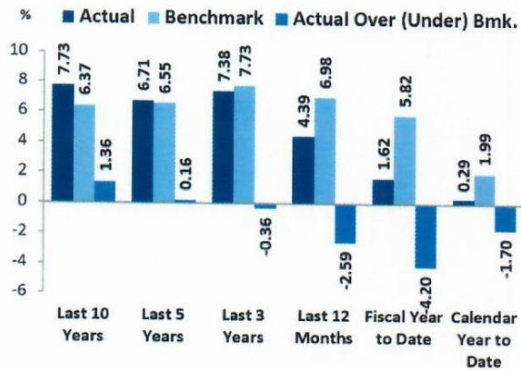
#### REAL ESTATE PERFORMANCE<sup>1</sup>



#### PRIVATE EQUITY PERFORMANCE<sup>1</sup>



#### STRATEGIC INVESTMENTS PERFORMANCE<sup>1</sup>



#### CASH PERFORMANCE



Employees' Retirement  
System of Georgia

# Annual Comprehensive Financial Report

*Fiscal Year Ended June 30, 2022*  
*A component unit of the State of Georgia*

## **Georgia's Waterfalls**



Tallulah Gorge State Park

# 2022



# Financial Section

CA. CA

## Management's Discussion and Analysis (Unaudited)

The following table presents the investment allocation at June 30, 2022, and 2021:

	2022	2021
<b>Asset allocation at June 30 (in percentages):</b>		
Equities:		
Domestic	46.3 %	47.5 %
International	13.3	15.8
Private equity	3.3	2.3
Domestic obligations:		
U.S. treasuries	19.7	17.6
Corporate and other bonds	5.8	5.3
International obligations:		
Corporates	0.5	0.9
Commingled funds	11.1	10.6
<b>Asset allocation at June 30 (in thousands):</b>		
Equities:		
Domestic	\$ 8,991,853	\$ 10,817,734
International	2,577,425	3,594,250
Private equity	631,937	525,508
Domestic obligations:		
U.S. treasuries	3,824,614	4,008,672
Corporate and other bonds	1,125,699	1,205,160
International obligations:		
Corporates	93,118	209,045
Mutual funds	7,338	8,969
Commingled funds	2,160,914	2,421,327
	<b>\$ 19,412,898</b>	<b>\$ 22,790,665</b>

The total investment portfolio decreased by \$3.4 billion, or 14.8%, from 2021, which is due to negative equity and bond market returns.

Investment performance is calculated using a time-weighted rate of return using the Daily Valuation Method. The time-weighted rate of return for the fiscal year ended June 30, 2022, was (11.7)% with a (15.3)% return for equities, a 32.8% return for private equity, and a (7.4)% return for fixed income. The five-year annualized rate of return at June 30, 2022, was 7.1% with a 8.7% return for equities, a 25.5% return for private equity, and a 1.2% return for fixed income.

A money-weighted return is weighted by the amount of dollars in the fund at the beginning and end of the performance period. A money-weighted return is highly influenced by the timing of cash flows into and out of the fund and is a better measure of an entity or person who controls the cash flows into or out of the fund. The non-discretionary cash flows for the plan, primarily contributions and benefit payments, have a considerable impact on the money-weighted returns of the portfolio. The money-weighted rate of return for the fiscal year ended June 30, 2022, was (18.7)%, compared to 19.4% for the fiscal year ended June 30, 2021.





# Hawaii ERS Quarterly Performance Report

Reporting Currency:BASE

As of Date:9/30/2022

Structure	Account/Security Id	Market Value	% of Total	3 Months	Fiscal YTD	YTD	1 Year	3 Years	5 Years	7 Years	ITD	Inception Date
<b>TOTAL FUND</b>												
TF RISK LAGGED BMK	HIEGRISK1000 HIEGX090TRSK	21,568,131,701.89	100.00	-1.35	-1.35	-2.99	0.57	8.84	7.72	8.75	7.90	6/1/1990
Excess Return VS TF RISK LAGGED BMK				-3.81	-3.81	-8.78	-6.46	5.18	5.19	6.68	7.62	6/1/1990
BROAD GROWTH	HIEGRISK1100 HIEGX090GRTH	13,804,677,135.08	64.00	2.45	2.45	5.79	7.03	3.66	2.53	2.07	0.27	6/1/1990
BROAD GROWTH BMK				-3.43	-3.43	-10.23	-5.40	8.97	7.80	9.50	7.77	10/1/2014
Excess Return VS BROAD GROWTH BMK				-5.98	-5.98	-13.95	-10.62	5.14	5.33	7.27	5.70	10/1/2014
PRIVATE GROWTH	HIEGRSK41700 HIEGX09PRIGR	4,002,376,505.36	18.56	2.55	2.55	3.72	5.22	3.53	2.47	2.23	2.06	10/1/2014
PRIVATE GROWTH BMK				-3.56	-3.56	3.14	11.16	22.72	20.36	18.17	17.68	7/1/2013
Excess Return VS PRIVATE GROWTH BMK				-15.17	-15.17	-14.03	-14.52	8.02	8.73	8.80	10.29	7/1/2013
PUBLIC GROWTH	HIEGRSK41600 HIEGX09LGRTH	6,394,973,541.43	29.65	11.61	11.61	17.17	25.68	14.70	11.63	9.36	7.39	7/1/2013
PUBLIC GROWTH BMK				-5.23	-5.23	-21.36	-17.91	3.05	3.65	6.62	6.63	7/1/2013
Excess Return VS PUBLIC GROWTH BMK				-5.17	-5.17	-19.83	-15.93	3.61	4.33	7.22	7.10	7/1/2013
REAL ASSETS	HIEGRISK7200 HIEGX090REAL	3,407,327,088.29	15.80	0.24	0.24	8.72	15.66	10.46	9.32	9.43	10.09	7/1/2013
REAL ASSETS BENCHMARK				3.74	3.74	17.35	23.50					7/1/2013
Excess Return VS REAL ASSETS BENCHMARK				-3.50	-3.50	-8.64	-7.84					7/1/2013
DIVERSIFYING STRATEGIES	HIEGRISK6100 HIEGX09DVS1K	7,323,129,275.39	33.95	3.39	3.39	16.69	15.72	5.35	6.57	6.57	5.70	4/1/2017
DIVERSIFYING STRATEGIES BMK				0.23	0.23	2.12	1.92	3.46	3.93	3.93	3.84	4/1/2017
Excess Return VS DIVERSIFYING STRATEGIES BMK				3.16	3.16	14.57	13.80	1.90	2.64	2.64	1.85	4/1/2017
ILLIQUID DIVERSIFYING	HIEGRISK6600 HIEGX08LLDIV	935,876,884.65	4.34	-3.89	-3.89	-2.11	-1.12				1.28	7/1/2020
ILLIQUID DIVERSIFYING BMK				-1.71	-1.71	-0.96	0.03				2.56	7/1/2020
Excess Return VS ILLIQUID DIVERSIFYING BMK				-2.18	-2.18	-1.15	-1.16				-1.28	7/1/2020
LIQUID DEFENSIVE	HIEGRSK69100 HIEGX08LIQDEF	3,184,430,448.07	14.76	6.33	6.33	26.05	24.59	9.30	7.67	6.65	6.65	4/1/2017
LIQUID DEFENSIVE BENCHMARK				0.07	0.07	2.58	1.45	3.77	3.48	3.48	3.22	4/1/2017
Excess Return VS LIQUID DEFENSIVE BENCHMARK				6.26	6.26	23.47	23.14	5.53	4.19	3.44	3.44	4/1/2017
LIQUID DIVERSIFYING	HIEGRSK67000 HIEGX08LIQDIV	3,202,804,638.37	14.85	3.08	3.08	12.81	11.75	2.18	7.94	7.94	7.02	4/1/2017
LIQUID DIVERSIFYING BENCHMARK				1.09	1.09	2.49	3.14	3.11	4.43	4.43	4.57	4/1/2017
Excess Return VS LIQUID DIVERSIFYING BENCHMARK				1.99	1.99	10.31	8.61	-0.94	3.51	3.51	2.45	4/1/2017
CRO FRM MASTER ACCOUNT	HIEF70161102 HIEGRISK1400 IX1F0000572C	17,304.30 440,325,291.42	0.00 2.04	0.46	0.46	0.58	-18.00	1.45	1.43	1.90	4/1/2017	4/1/2008
ICE BoFA US 3 Month Treasury Bill Index G001				-7.97	-7.97	-21.63	0.62	0.60	1.15	0.95	4/1/2008	4/1/2008
Excess Return VS ICE BoFA US 3 Month Treasury Bill Index G001				0.47	0.47	0.61	-18.63	0.85	0.28	0.95		
				-8.43	-8.43	-22.25						

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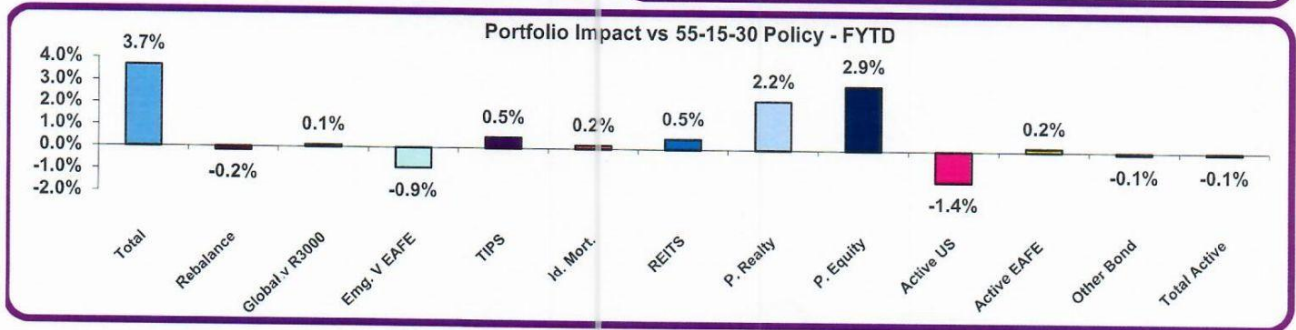
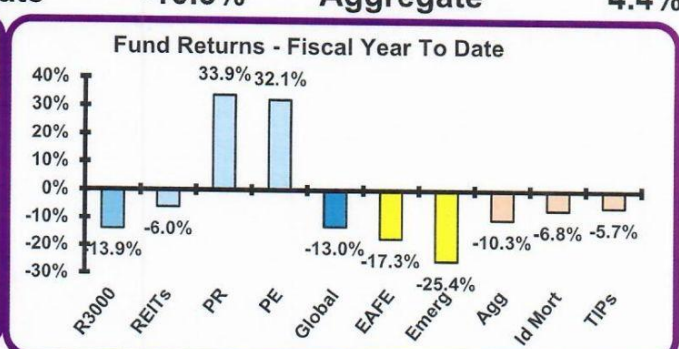
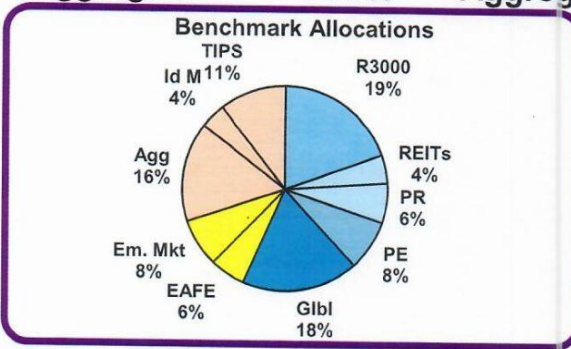
# PERSI INVESTMENT REPORT

Month to Date Report

June 30, 2022

CURRENT VALUE OF THE FUND	\$	20,835,089,486
FISCAL YEAR NET CHANGE IN ASSETS	\$	(2,646,229,444)
FISCAL YEAR TO DATE RETURNS		-9.5%
MONTH TO DATE RETURNS		-5.3%

<u>Month Returns</u>		<u>Fiscal Year Returns</u>		<u>25 Year Returns</u>	
<b>Total Fund</b>	<b>-5.3%</b>	<b>Total Fund</b>	<b>-9.5%</b>	<b>Total Fund</b>	<b>7.1%</b>
55-15-30	-6.5%	55-15-30	-13.1%	55-15-30	6.7%
<b>U.S Equity</b>	<b>-5.7%</b>	<b>U.S Equity</b>	<b>-3.6%</b>	<b>U.S Equity</b>	<b>8.4%</b>
R3000	-8.4%	R3000	-13.9%	R3000	8.1%
<b>Global Equity</b>	<b>-7.4%</b>	<b>Global Equity</b>	<b>-13.0%</b>	<b>Global Equity</b>	<b>7.9%</b>
MSCI World	-8.6%	MSCI World	-13.9%	MSCI World	6.4%
<b>Foreign Equity</b>	<b>-8.2%</b>	<b>Foreign Equity</b>	<b>-21.2%</b>	<b>Foreign Equity</b>	<b>5.0%</b>
MSCI EAFE	-9.3%	MSCI EAFE	-17.3%	MSCI EAFE	4.3%
<b>Fixed Income</b>	<b>-2.1%</b>	<b>Fixed Income</b>	<b>-8.5%</b>	<b>Fixed Income</b>	<b>5.0%</b>
Aggregate	-1.6%	Aggregate	-10.3%	Aggregate	4.4%



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U.S./Global Equity Managers

	Month	3 MO	FYTD	1 Yr	2 Yr	3 Yr	4 Yr	5 Yr
Mellon S&P 500 Fund	-8.1%	-16.0%	-9.9%	-9.9%	12.4%	11.0%	11.0%	11.8%
Mellon Mid and Small	-9.4%	-20.4%	-31.0%	-31.0%	5.5%	3.4%	2.6%	4.6%
Peregrine	-8.1%	-28.6%	-38.8%	-38.8%	-11.9%	2.2%	6.3%	10.4%
S&P 500 Growth	-8.3%	-20.8%	-16.4%	-16.4%	8.7%	11.6%	11.7%	13.5%
S&P 500	-8.3%	-16.1%	-10.6%	-10.6%	12.2%	10.6%	10.6%	11.3%
Mtn. Pacific	-6.7%	-13.6%	-16.0%	-16.0%	10.7%	7.4%	8.7%	9.1%
D. Smith	-15.0%	-17.3%	-6.7%	-6.7%	22.0%	7.3%	5.0%	5.6%
Russell 2500	-9.6%	-17.0%	-21.0%	-21.0%	11.7%	5.9%	4.9%	7.0%
BLS	-5.5%	-10.0%	-13.3%	-13.3%	13.4%	8.0%	9.9%	12.1%
Fiera	-6.5%	-13.6%	-12.8%	-12.8%	11.5%	9.6%	11.6%	12.1%
Bernstein Global	-9.9%	-14.3%	-17.8%	-17.8%	10.5%	3.4%	0.9%	1.9%
Brandes	-8.8%	-10.0%	-9.2%	-9.2%	17.0%	6.9%	4.8%	5.4%
Longview	-7.1%	-12.1%	-8.9%	-8.9%	13.4%	6.2%	6.6%	7.5%
Walter Scott	-8.0%	-15.7%	-16.0%	-16.0%	6.6%	6.7%	8.7%	10.2%
R3000	-8.4%	-16.7%	-13.9%	-13.9%	11.3%	9.7%	9.5%	10.5%
World Index	-8.6%	-16.1%	-13.9%	-13.9%	9.6%	7.5%	7.3%	8.1%
Private Equity	-0.5%	1.5%	32.1%	32.1%	41.2%	23.2%	20.9%	20.4%
R3000	-8.4%	-16.7%	-13.9%	-13.9%	11.3%	9.7%	9.5%	10.5%
Adelante	-7.4%	-18.3%	-5.9%	-5.9%	12.7%	5.7%	7.8%	7.2%
Mellon REIT	-7.7%	-18.1%	-6.4%	-6.4%	14.4%	2.5%	4.3%	4.1%
Real Estate	-3.0%	-5.4%	13.7%	13.7%	15.7%	10.1%	10.6%	10.0%
NCREIF	1.2%	3.6%	13.8%	13.8%	8.0%	7.1%	7.0%	7.1%
DJ Select REIT	-7.8%	-18.1%	-6.4%	-6.4%	14.5%	2.5%	4.3%	4.3%
<b>International Equity Managers</b>								
Index Fund	-9.2%	-14.3%	-17.4%	-17.4%	4.8%	1.6%	1.5%	2.7%
Mondrian	-8.4%	-9.3%	-10.9%	-10.9%	9.6%	1.6%	1.8%	2.4%
International Index	-9.3%	-14.3%	-17.3%	-17.3%	4.8%	1.5%	1.6%	2.7%
Bernstein Em. Mkt	-10.9%	-14.6%	-15.4%	-15.4%	13.0%	3.3%	3.1%	2.9%
Genesis Em. Mkts	-7.1%	-14.7%	-33.9%	-33.9%	-3.7%	-4.0%	-1.2%	0.7%
Mellon Emerging	-6.6%	-11.8%	-25.6%	-25.6%	2.4%	1.0%	1.1%	2.5%
Emerging Mkts	-6.6%	-11.3%	-25.0%	-25.0%	3.0%	0.9%	1.1%	2.5%

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INDIANA

## Investment Results - Consolidated Defined Benefit Assets, continued

### Time-Weighted Rates of Return by Asset Class vs Benchmark Returns <sup>1</sup> As of June 30, 2021

Global Asset Class	1-Year	Annualized	
		3-Years	5-Years
<b>Public Equity</b>	42.5 %	15.5 %	15.8 %
Benchmark	40.9	14.2	14.6
<b>Private Markets</b>	47.9	22.1	19.0
Benchmark	75.2	14.8	16.8
<b>Fixed Income - Ex Inflation - Linked</b>	3.4	7.6	5.2
Benchmark	0.6	6.6	4.3
<b>Fixed Income - Inflation - Linked</b>	6.3	8.8	6.3
Benchmark	5.5	9.2	6.3
<b>Commodities</b>	55.0	1.4	3.5
Benchmark	43.7	(0.3)	1.7
<b>Real Estate</b>	16.8	9.2	10.0
Benchmark	24.9	9.4	6.3
<b>Absolute Return</b>	12.2	5.5	5.9
Benchmark	18.9	6.1	5.4
<b>Risk Parity</b>	23.7	11.4	9.4
Benchmark	23.3	10.7	10.1
<b>Cash + Cash Overlay</b>	(5.7)	3.0	4.6
Benchmark	21.7	10.7	9.4
<b>Consolidated Defined Benefit Assets</b>	25.5	11.4	10.3
Target Index	24.7	10.9	9.5

<sup>1</sup> See Accompanying Notes to the Actual and Benchmark Returns.

PORTFOLIO PERFORMANCE – FIGURE 2

**FIGURE 2 – PORTFOLIO PERFORMANCE/INVESTMENT RETURNS**  
June 30, 2021

		Net Portfolio Performance											
		1 YR			3 YR			5 YR			10 YR		
Total Portfolio		25.8%			12.1%			11.2%			9.1%		
		(Annualized)											
	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	3 Yrs	5 Yrs	10 Yrs
	%	%	%	%	%	%	%	%	%	%	%	%	%
<b>Total Fund</b>	<b>25.8</b>	<b>4.6</b>	<b>7.1</b>	<b>7.6</b>	<b>12.3</b>	<b>(0.8)</b>	<b>4.7</b>	<b>17.9</b>	<b>14.1</b>	<b>0.1</b>	<b>12.1</b>	<b>11.2</b>	<b>9.1</b>
Composite Benchmark**	21.9	4.9	7.0	7.4	12.0	0.7	4.0	16.3	11.8	0.9	10.8	10.3	8.4
Consumer Price Index	5.4	0.7	1.6	2.9	1.6	1.0	0.1	2.1	1.8	1.7	2.5	2.4	1.9
<b>U.S. Equities</b>	<b>43.4</b>	<b>6.4</b>	<b>10.3</b>	<b>14.3</b>	<b>18.7</b>	<b>(1.7)</b>	<b>6.4</b>	<b>24.1</b>	<b>23.3</b>	<b>1.3</b>	<b>18.9</b>	<b>18.0</b>	<b>13.9</b>
Russell 3000 Index	44.2	6.5	9.0	14.8	18.5	2.1	7.3	25.2	21.5	3.8	18.7	17.9	14.7
<b>International Equities</b>	<b>39.2</b>	<b>(2.9)</b>	<b>1.2</b>	<b>7.6</b>	<b>22.1</b>	<b>(7.1)</b>	<b>(1.0)</b>	<b>23.8</b>	<b>16.8</b>	<b>(10.7)</b>	<b>11.0</b>	<b>12.4</b>	<b>7.7</b>
MSCI-ACWI ex US Index	37.2	(4.7)	0.3	7.7	20.5	(9.2)	(4.6)	22.8	14.4	(14.4)	9.4	11.2	5.7
<b>Fixed Income</b>	<b>5.0</b>	<b>7.8</b>	<b>7.5</b>	<b>0.9</b>	<b>0.9</b>	<b>1.6</b>	<b>(1.4)</b>	<b>6.5</b>	<b>2.4</b>	<b>6.8</b>	<b>6.7</b>	<b>4.4</b>	<b>3.6</b>
Barclays Capital U.S. Universal Index	1.1	7.9	8.1	(0.3)	0.9	5.8	1.6	5.2	0.2	7.4	5.6	3.5	3.7
<b>Real Estate</b>	<b>13.7</b>	<b>2.3</b>	<b>5.4</b>	<b>7.3</b>	<b>7.1</b>	<b>12.0</b>	<b>16.3</b>	<b>14.5</b>	<b>13.0</b>	<b>5.3</b>	<b>7.0</b>	<b>7.1</b>	<b>9.2</b>
Real Estate CB	1.5	3.9	6.6	7.1	6.9	10.8	13.4	11.7	11.1	11.3	4.0	5.2	8.4
<b>Infrastructure</b>	<b>11.6</b>	<b>6.0</b>	<b>13.6</b>	<b>13.3</b>	<b>13.5</b>	<b>13.9</b>	<b>7.5</b>	<b>19.1</b>	<b>9.8*</b>	<b>2.8*</b>	<b>11.1</b>	<b>12.0</b>	<b>11.3</b>
Infrastructure Index	9.1	4.2	5.2	6.5	0.9	5.8	1.6	5.2	0.2*	7.4*	6.1	5.1	4.6
<b>Private Equity</b>	<b>54.9</b>	<b>7.9</b>	<b>19.8</b>	<b>20.6</b>	<b>17.9</b>	<b>7.9</b>	<b>21.5</b>	<b>24.7</b>	<b>16.2</b>	<b>7.6</b>	<b>26.0</b>	<b>23.3</b>	<b>19.8</b>
Private Equity CB	53.2	3.3	13.5	16.1	17.3	-	-	-	-	-	21.6	19.6	15.4

Note: Calculations are based on a time series of linked monthly returns (IRR), producing a time weighted effect.  
\* Value obtained from plan consultant annual performance reporting

\*\* Composite Benchmark:

Effective 07/17: 23% Russell 3000; 13% MSCI-EAFE Index; 8% MSCI Emerging Markets Index; 7% Cambridge Private Equity Index (10 lagged); 10% Barclays Aggregate; 4% Barclays Intermediate Treasuries; 4% Barclays Long Term Treasury Index; 4% Barclays US TIPS Index; 2.5% Barclays High Yield Index; 2.5% CSFB Leveraged Loan Index; 1.0% JPM GBI EM Global Diversified (unhedged); 1.0% JPM EMBI Global Diversified (hedged); 8% S&P/STO US Levered Loan 100 Index; 10% NCREIF ODCE; 2% CPI + 3.5%

Effective 07/16: 23% Russell 3000; 13% MSCI-EAFE Index; 7% MSCI Emerging Markets Index; 10% Cambridge Private Equity Index; 11% Barclays Aggregate; 3% Barclays Long Term Treasury Index; 5% Barclays US TIPS Index; 3% Barclays High Yield Index; 3% CSFB Leveraged Loan Index; 1.5% JPM GBI EM Global Diversified (unhedged); 1.5% JPM EMBI Global Diversified (hedged); 11% NCREIF; 5% CPI+4%; 3% HFRI Fund of Fund Composite

Effective 06/14: 30% Russell 3000; 20% MSCI-ACWI ex US/IMI Geos; 25% Barclays Capital U.S. Universal; 10% NCREIF ODCE; 5% Custom Private Equity Benchmark which is based on preliminary data subject to change; 10% HFRI Fund of Funds Index. The Custom Private Equity benchmark is based on peer review universe return data compiled and published by Cambridge Associates LLC. The custom benchmark returns are calculated as pooled internal rates of return (IRR).



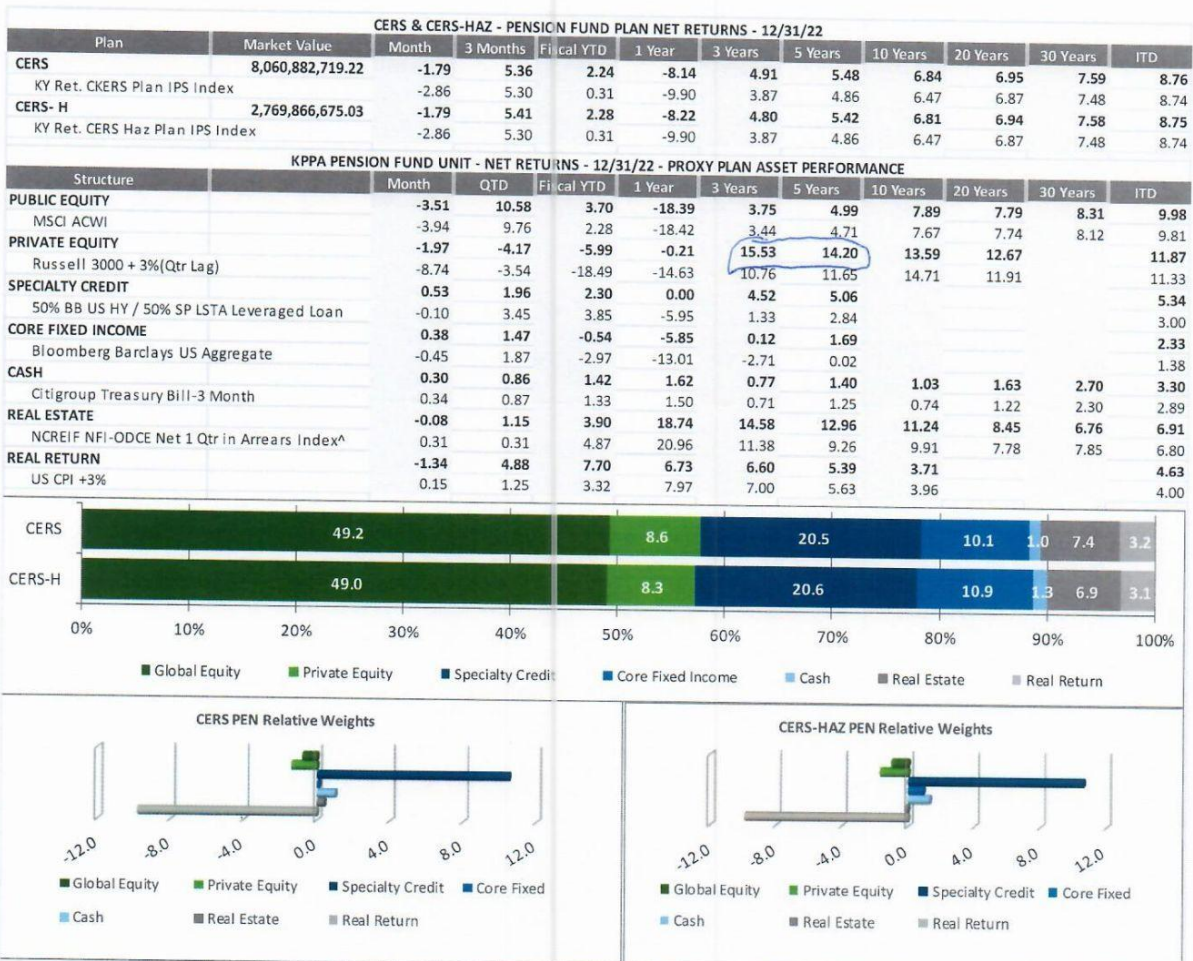
Kentucky

The private equity allocation fell -1.97% during the month, bringing the fiscal year return to -5.99%. Trailing public marks have significantly affected the overall performance of the portfolio, the 1-year return crossed into negative territory, now at -0.21% as of 12/31/22.

The real return portfolio fell -1.34% during the month, compared to its benchmark return of 0.15%. As with several of the previous month, performance was driven by the MLP portion of the portfolio (approximately 40% of the allocation); the investment was down -4.81%. For the fiscal year, the portfolio has returned 7.70%, bringing the 1-year return to 6.73%.

Real estate remained relatively flat during the month, falling 8bps. The latest quarter performance of 1.15% brought the 1-year return to 18.74% versus 20.96%. The portfolio has benefitted from recent strength in industrial, multi-family, student housing, and storage properties.

The cash portfolio returned 0.30% during the month compared with the 3-month T-bill's 0.34%. This brought the fiscal year return to 1.42% (versus 1.33%).



Investment Performance

Performance: Actual Returns vs. Benchmark Returns  
(All returns are time weighted)

Fiscal Year Ended June 30	Infrastructure			Private Equity			Natural Resources			Alternative Credit			Risk Diversifiers		
	Actual Return	Benchmark Return <sup>7</sup>	Excess Return <sup>1</sup>	Actual Return	Benchmark Return <sup>8</sup>	Excess Return <sup>1</sup>	Actual Return	Benchmark Return <sup>9</sup>	Excess Return <sup>1</sup>	Actual Return	Benchmark Return <sup>10</sup>	Excess Return <sup>1</sup>	Actual Return	Benchmark Return <sup>11</sup>	Excess Return <sup>1</sup>
2022	23.0%	20.8%	2.2%	23.0%	15.3%	7.7%	5.8%	32.8%	-26.9%	4.7%	1.5%	3.2%	4.2%	-4.6%	8.8%
2021	19.1%	19.3%	-0.3%	60.9%	67.4%	-6.5%	7.8%	20.1%	-12.4%	12.8%	22.0%	-9.2%	6.8%	10.7%	-3.9%
2020	-0.7%	1.4%	-2.1%	0.8%	-10.7%	11.5%	4.1%	-27.5%	31.6%	1.1%	-10.2%	11.3%	-9.9%	4.4%	-14.3%
2019	16.9%	13.4%	3.5%	11.2%	12.3%	-1.0%	4.1%	0.3%	3.8%	5.9%	5.8%	0.1%	-1.1%	5.6%	-6.8%
2018	16.6%	11.8%	4.8%	22.7%	18.2%	4.5%	11.5%	6.1%	5.3%	5.0%	3.5%	1.6%	6.4%	4.8%	1.6%
2017	14.7%	8.0%	6.7%	19.8%	22.1%	-2.3%	7.5%	21.2%	-13.7%						
2016	6.8%	5.9%	0.9%	6.6%	5.1%	1.5%	5.5%	-17.8%	23.2%						
2015	5.4%	4.9%	0.5%	8.9%	10.4%	-1.5%									
2014	15.5%	6.6%	8.9%	9.8%	28.8%	-18.9%									
2013	4.4%	6.5%	-2.1%	8.8%	25.1%	-16.3%									
3 years ending 2022	13.3%	13.5%	-0.2%	25.9%	19.9%	6.0%	5.9%	5.0%	0.9%	6.1%	3.6%	2.5%	0.1%	3.3%	-3.2%
5 years ending 2022	14.7%	13.1%	1.5%	22.2%	18.0%	4.2%	5.6%	4.3%	2.3%	5.9%	4.0%	1.9%	1.1%	4.1%	-3.0%
10 years ending 2022	11.9%	9.7%	2.2%	16.3%	18.0%	-1.7%									

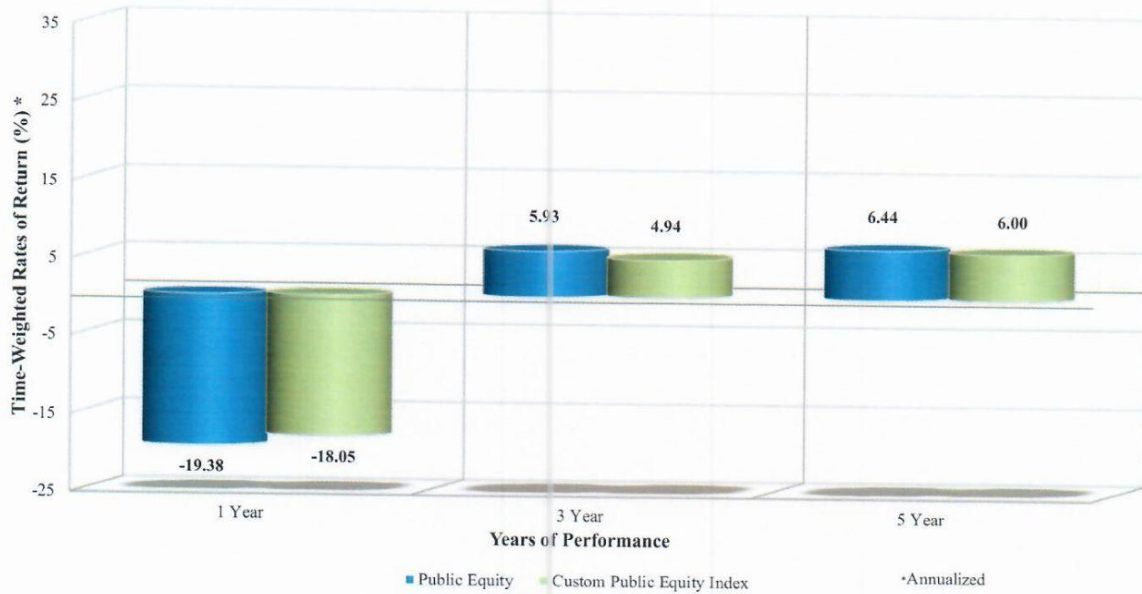
Notes:

1. Excess Return is Actual Return minus Benchmark Return; Difference may be slightly off due to rounding
2. Total Fund Benchmark: A combination of the benchmarks for every asset class using the target asset class weights.
3. Domestic Equity Benchmark: Russell 3000 Index
4. Foreign Equity Benchmark: Morgan Stanley Capital International All Country World Ex-U.S. Free
5. General Fixed Income Benchmark: 50% Barclays Capital Aggregate Bond Index ex Treasury, 25% Bloomberg US Govt Bond Index, 25% Bloomberg US TIPS Index
6. Real Estate Benchmark: NCREIF Property Index (Lagged one Quarter)
7. Infrastructure Benchmark: CA Infrastructure Median (Lagged one Quarter)
8. Private Equity Benchmark: Russell 3000 Index + 3% (Lagged one Quarter)
9. Natural Resources Benchmark: CA Natural Resources Median (Lagged one Quarter)
10. Alternative Credit Benchmark: 50% Bank of America US High Yield II + 50% S&P/Loan Syndications & Trading Association US Leverage Loan Index
11. Risk Diversifiers Benchmark: 0.3 Beta Morgan Stanley Capital International All Country World Index



**MARYLAND STATE RETIREMENT AND PENSION SYSTEM**  
**COMPARATIVE INVESTMENT RETURNS ENDING JUNE 30, 2022**

**PUBLIC EQUITY**



**PRIVATE EQUITY**



**MARYLAND STATE RETIREMENT AND PENSION SYSTEM**

**ALTERNATIVE INVESTMENTS RELATIONSHIP LISTING**

as of June 30, 2022

Private Equity -232 Funds-

1315 Capital,LP	Crescent Capital Partners V,LP	Institutional Venture Partners XV	Partners Group Secondary 2011,LP
1315 Capital II,LP	Crowdstrike Holdings Inc. A	Institutional Venture Partners XVI	Partners Group Secondary 2015,LP
89BIO INC	CVC Capital Partners VII, LP	Institutional Venture Partners XVII	Phathom Pharmaceuticals, Inc
Advent Central & Eastern Europe IV,LP	CVC Capital Partners VIII, LP	Institutional Venture Partners XVII	Point 406 Ventures 2016 Opportunities
Advent International GPE V-D,LP	CVC European Equity Partners V-B,LP	Co-Investments	Fund
Advent International GPE VI-A,LP	Datadog Inc. Class-A	Jade Equity Investors	Point 406 Ventures II,LP
Advent International GPE VIII,LP	Dover Street VII,LP	Jade Project Sun Co-Invest	Point 406 Ventures III,LP
Advent International GPE IX,LP	Eargo Inc	Landmark Equity Partners Co-Investment	Point 406 Ventures IV,LP
Apax Europe VI-A,LP	Equistone Partners Europe Fund IV,LP	Fund XVI,LP	Point 406 Ventures Opportunities Fund II
Apax Europe VII-A,LP	Equistone Partners Europe Fund V,LP	Landmark Equity Partners XIV, LP	Roark Capital Partners IV,LP
Apax IX	Equistone Partners Europe Fund VI,LP	Landmark Equity Partners XV,LP	Roark Capital Partners V,LP
AP IX Connect Co-Invest Holdings, L.P.	Everstone Capital Partners II,LLC	Landmark Equity Partners XVI,LP	Sierra Oncology, Inc
(Brightspeed)	Everstone Capital Partners III,LLC	Lexington Capital Partners,VII	Silver Lake Partners V,LP
Apollo Investment Fund VII Euro	Exact Sciences Corp	Lexington Co-Investment Partners IV	Silver Lake Partners VI,LP
Holdings, LP	FP Co Invest Audax	Lexington Co-Investment Partners V	Spark Capital Growth Fund IV, LP
Apollo Investment Fund VIII (AIF),LP	Frazier GB IX Proj Thrm Coinvestment	Lexington Co-Investment Partners V-	Spark Capital VII, LP
Apollo Investment Fund IX, LP	Frazier Healthcare Growth Buyout Fund	Overage	Sumo Logic, Inc
Arcadia II Beteiligungen BTGmbH&Co	VIII,LP	Lexington Middle Market Investors III,LP	TA Associates XI,LP
Arcutis Biotherapeutics, INC	Frazier Healthcare Growth Buyout Fund	Lexington Middle Market Investors IV,LP	TA Associates XII,LP
Astorg VII	IX,LP	Lightspeed Opportunity Fund,LP	TA Associates XIII,LP
Audax Private Equity Fund II,LP	Frazier Healthcare Growth Buyout Fund	Lightspeed Opportunity Fund II	TA Associates XIV
Audax Private Equity Fund III,LP	X,LP	Lightspeed Vent Partners Select V	TDR Capital III,LP
Audax Private Equity Fund IV,LP	Frazier Healthcare V,LP	Lightspeed Vent Partners XIV A, LP	TDR Capital IV,LP
Audax Private Equity Fund V,LP	Frazier Healthcare VI,LP	Lightspeed Vent Partners XIV B, LP	Thoma Bravo Fund XII,LP
Audax Private Equity Fund VI,LP	Frazier Healthcare VII,LP	Littlejohn Fund III,LP	Thoma Bravo Fund XIII,LP
Bain Capital Asia Fund III	Frazier LifeSciences VIII,LP	Littlejohn Fund IV,LP	Thoma Bravo Fund XIV,LP
Bain Capital Asia Fund IV	Frazier LifeSciences IX,LP	Littlejohn Fund V,LP	Thoma Bravo Project Alpine Co-Invest
Bain Capital Europe Fund IV,LP	Frazier LifeSciences X,LP	Littlejohn Fund VI,LP	Tiger Iron Old Line Fund,LP
Bain Capital Europe Fund V,LP	Frazier Life Sciences XI, LP	LLR Equity Partners IV,LP	Tiger Iron Old Line Fund II,LP
Bain Capital Fund X,LP	Frontier Fund III,LP	LLR Equity Partners V,LP	Tiger Iron Old Line Fund III
Bain Capital Fund XI,LP	Frontier Fund IV,LP	LLR Equity Partners VI,LP	TPG Partners VII,LP
Bain Capital Fund XII,LP	Frontier Fund V,LP	Longitude Venture Partners II LP	TPG Partners VII,LP
Bain Capital Fund XIII,LP	GGV Capital VII,LP	Longitude Venture Partners III LP	Upath Inc, Class A
Bain Capital Life Sciences Fund, LP	GGV Capital VII Plus,LP	Longitude Venture Partners IV, LP	Vauxcye, Inc
Bain Capital LifeSciences Fund II,LP	GGV Capital VIII,LP	Madison Dearborn Capital Partners V,LP	Vista Equity Partners Fund IV,LP
BCPE Osprey Investor, LP	GGV Capital VIII Plus,LP	Madison Dearborn Capital Partners VI,LP	Vista Equity Partners Fund V,LP
Baring Asia Private Equity Fund VI,LP	GGV Discovery II,LP	Madison Dearborn Capital Partners	Vista Equity Partners Fund VI,LP
Baring Asia Private Equity Fund VII,LP	GGV Discovery III,LP	VII,LP	Vista Equity Partners Fund VII,LP
Black River Capital Partners Fund	Goldman Sachs Vintage Fund V,LP	Madison Dearborn Capital Partners	Vista Foundation Fund II,LP
(Agr.A), LP	Great Hill Equity Partners IV,LP	VIII,LP	Vista Foundation Fund III,LP
Blackstone Capital Partners VI,LP	Great Hill Equity Partners V,LP	Maryland Innovation Opportunity Fund I	Vista Foundation Fund IV,LP
Blackstone Capital Partners VII,LP	Great Hill Equity Partners VI,LP	MBK Partners Fund III,LP	Vista Foundation Project Avalanche
Blue Wolf Capital Fund III,LP	Great Hill Equity Partners VII,LP	MBK Partners Fund IV,LP	Co-Invest
Blue Wolf Capital Fund IV,LP	Great Hill Project Compass	MBK Partners Fund V,LP	Vista Project Dynamo Co-Invest
Bridgepoint Europe Fund V,LP	Green Equity Investors VII	MD Asia Investors,LP	Vistria Fund I,LP
Bridgepoint Europe Fund V,LLP	Green Equity Investors VIII	MDAsia Investors II,LP	Vistria Fund II,LP
Brinson Partnership 2000 Primary Fund	Gristone Bio Inc	MD Asia Investors III,LP	Vistria Fund III,LP
Brinson Partnership 2001 Primary Fund	Harbour Vest Partners VI-Partnership	MD Asia Investors IV,LP	Vistria Fund IV
Brinson Partnership 2002 Primary Fund	Fund,LP	Molecular Templates Inc	Wind Point Partners CTSI Co-Invest
Brinson Partnership 2002 Secondary	Hellman&Friedman Capital Partners	Navis Asia Fund VI,LP	Wind Point Partners VII,LP
Fund	VI,LLC	New Mainstream Capital Fund II,LP	Wind Point Partners VIII,LP
Brinson Partnership 2003 Primary Fund	Hellman&Friedman Capital Partners	New Mainstream Capital Fund III,LP	Wind Point Partners IX
CDH Fund V,LP	VII,LLC	New Mountain Partners III,LP	
ChrysCapital VIII, LLC	Hellman&Friedman Capital Partners	New Mountain Partners IV,LP	
Clayton, Dubilier&Rice Fund VIII,LP	VIII,LLC	New Mountain Partners V,LP	
Clayton, Dubilier&Rice Fund IX,LP	Hellman&Friedman Capital Partners	New Mountain Partners VI,LP	
Clayton, Dubilier&Rice Fund X,LP	IX,LLC	North Sky CleanTech Fund IV,LP	
Clayton, Dubilier&Rice Fund XI,LP	Hellman&Friedman Capital Partners	Orchid Asia V,LP	
Clearlake Capital Partners III,LP	X,LLC	Orchid Asia VI,LP	
Clearlake Capital Partners IV,LP	Hg Co-Investment Fund	Orchid Asia VII,LP	
Clearlake Capital Partners V,LP	Hg Genesis 9	Orchid Asia VIII, LP	
Clearlake Capital Partners VI, LP	HgCapital 5,LP	Pacific Equity Partners V,LP	
Clearlake Capital Partners VII, LP	HgCapital 6A,LP	Pacific Equity Partners VI,LP	
Coller Capital Partners VI,LP	HgCapital 7C,LP	PAG Asia Capital III,LP	
Coller Capital Partners VII,LP	HgCapital 8A,LP	PAG Asia Capital III,LP	
Coller Capital Partners VIII, LP	HgCapital Mercury A,LP	Partners Group Emerging 2011,LP	
Crescent Capital Partners IV,LP	Indigo Coinvestment MBK	Partners Group Secondary 2008, LP	

MASS

**PRIT Fund Periodic Table of Returns**  
(Gross of Fees) as of June 30, 2021

1 Year	3 Year	5 Year	10 Year
PRIVATE EQUITY 72.7%	PRIVATE EQUITY 28.8%	PRIVATE EQUITY 25.9%	PRIVATE EQUITY 20.8%
GLOBAL EQUITY 42.5%	GLOBAL EQUITY 14.3%	GLOBAL EQUITY 15.1%	GLOBAL EQUITY 10.4%
VALUE-ADDED FIXED INCOME 18.5%	REAL ESTATE 7.9%	REAL ESTATE 7.9%	REAL ESTATE 10.0%
REAL ESTATE 17.0%	CORE FIXED INCOME 7.0%	VALUE-ADDED FIXED INCOME 7.0%	VALUE-ADDED FIXED INCOME 5.4%
PORTFOLIO COMPLETION STRATEGIES 13.0%	VALUE-ADDED FIXED INCOME 6.5%	PORTFOLIO COMPLETION STRATEGIES 5.2%	TRADITIONAL 5.0%
TRADITIONAL 5.0%	PORTFOLIO COMPLETION STRATEGIES 5.0%	TRADITIONAL 5.0%	CORE FIXED INCOME 5.0%
CORE FIXED INCOME (0.8%)	TRADITIONAL 3.0%	CORE FIXED INCOME 3.5%	PORTFOLIO COMPLETION STRATEGIES 3.0%

Source: BNY Mellon

**Fiscal Year 2021 Highlights**

1. **PRIM Private Equity ranked #4** in private equity returns among nearly 200 U.S. public pension funds based on 10-year performance. The PRIT Fund is the only fund that has been in the top 5 of all private equity portfolios in every year the *American Investment Council* has performed the study – including #1 rankings in 2019, 2018, 2015 and 2013.
2. For the 16<sup>th</sup> consecutive year, the PRIT Fund was awarded the Government Finance Officer Association’s **Certificate of Achievement for Excellence in Financial Reporting** for the completeness and timeliness of our Annual Comprehensive Financial Report.
3. The PRIM Board’s Executive Director/Chief Investment Officer is a founding member of the CFA Institute’s Global Diversity and Inclusion Advisory Committee and is assisting the CFA Institute with the development of a Global Diversity and Inclusion Code of Conduct.
4. The PRIM Board deployed \$4.4 billion in new investments during fiscal year 2021.
  - a. Committed to funding 22 Private Equity Funds totaling \$2.8 billion.
  - b. Allocated \$400 million in Other Credit Opportunities.

I created the “Best performing Asset Class” from the ML performance. You can see these numbers on the performance page. (All tricky IRR)

## Nevada PERS

December 31, 2022

Performance Gross of Fees

Asset Class	Sub-Asset Class	Market Value (Millions)	Target Allocation	Actual Allocation	FYTD Return	One Year	3 Years	5 Years	10 Years	Since Inception
U.S. Stocks	S&P 500 Index	\$ 21,792	42.0%	40.5%	2.3%	-17.9%	7.7%	9.4%	12.5%	10.3%
	<b>Total U.S. Stocks</b>	\$ 21,792	<b>42.0%</b>	<b>40.5%</b>	<b>2.3%</b>	<b>-17.9%</b>	<b>7.7%</b>	<b>9.4%</b>	<b>12.6%</b>	<b>11.1%</b>
International Stocks	Market Return	\$ 9,616	18.0%	17.9%	5.7%	-18.1%	7.7%	9.4%	12.6%	11.3%
	MSCI World x US Index	\$ 9,616	18.0%	17.9%	5.7%	-13.7%	1.7%	2.2%	5.2%	5.6%
U.S. Bonds	<b>Total Intl. Stocks</b>	\$ 9,616	<b>18.0%</b>	<b>17.9%</b>	<b>5.7%</b>	<b>-13.7%</b>	<b>1.7%</b>	<b>2.2%</b>	<b>5.2%</b>	<b>5.3%</b>
	Market Return	\$ 14,016	28.0%	26.1%	-3.9%	-14.3%	1.3%	1.8%	4.8%	4.8%
U.S. Bonds	US Bond Index	\$ 14,016	28.0%	26.1%	-3.9%	-6.1%	0.5%	1.8%	1.7%	4.2%
	<b>Total U.S. Bonds</b>	\$ 14,016	<b>28.0%</b>	<b>26.1%</b>	<b>-3.9%</b>	<b>-6.1%</b>	<b>0.5%</b>	<b>1.8%</b>	<b>1.8%</b>	<b>6.6%</b>
Private Markets	Market Return	\$ 3,370	6.0%	6.3%	-1.5%	-6.6%	0.3%	1.7%	1.6%	6.5%
	Private Real Estate	\$ 3,370	6.0%	6.3%	-1.5%	6.4%	9.1%	9.0%	9.4%	7.8%
Private Markets	Private Equity	\$ 4,712	6.0%	8.8%	-6.1%	-5.0%	23.7%	21.4%	18.4%	13.7%
	<b>Total Private Markets</b>	\$ 8,082	<b>12.0%</b>	<b>15.0%</b>	<b>-4.2%</b>	<b>-0.5%</b>	<b>17.7%</b>	<b>16.0%</b>	<b>14.2%</b>	<b>11.3%</b>
Cash	Market Return	\$ 307	0.0%	0.6%	1.1%	-7.4%	10.2%	12.2%	8.3%	
<b>Total PERS' Fund</b>		\$ 53,813	<b>100.0%</b>	<b>100.0%</b>	<b>0.2%</b>	<b>-11.5%</b>	<b>6.5%</b>	<b>7.3%</b>	<b>8.6%</b>	<b>9.2%</b>
Market Return					1.3%	-12.7%	5.1%	6.3%	8.1%	8.9%

**NJ Division of Investment  
Pension Fund Asset Class Returns vs Benchmarks  
Periods Ending December 31, 2022  
Returns are Net of All Fees**

	Annualized					
	1 Month	YTD	FYTD	1 Year	3 Year	5 Year
U.S. Equity	(5.87)	(19.19)	2.41	(19.19)	7.24	8.23
Custom US Policy Benchmark	(5.89)	(19.22)	2.44	(19.22)	7.25	8.98
Non U.S. Developed Mkt Equity	(0.67)	(15.09)	5.22	(15.09)	1.40	2.09
Custom EAFE + Canada Benchmark <sup>1</sup>	(0.52)	(14.29)	5.29	(14.29)	1.17	1.72
EM Equity Composite	(1.90)	(18.31)	(0.69)	(18.31)	(1.82)	(0.94)
Custom EM Benchmark <sup>1</sup>	(1.41)	(20.17)	(3.02)	(20.17)	(2.64)	(1.38)
Equity Oriented Hedge Funds	3.81	(0.96)	3.20	(0.96)	(29.21)	(20.40)
50 HFRI EH 50 HFRI ED ACTIVIST (1Month Lag)	3.06	(9.53)	(0.78)	(9.53)	5.92	4.19
Private Equity	0.31	0.61	(0.66)	0.61	16.46	14.58
Custom Cambridge Blend	(1.69)	(2.89)	(6.58)	(2.89)	17.85	16.09
<b>Global Growth</b>	<b>(3.04)</b>	<b>(14.49)</b>	<b>2.04</b>	<b>(14.49)</b>	<b>6.51</b>	<b>7.09</b>
<b>Global Growth Policy Benchmark</b>	<b>(3.37)</b>	<b>(14.29)</b>	<b>1.09</b>	<b>(14.29)</b>	<b>8.09</b>	<b>8.32</b>
Real Estate	(0.48)	1.08	(2.35)	1.08	6.91	8.33
Real Estate Index <sup>2</sup>	0.31	20.96	4.87	20.96	11.38	9.26
Real Assets	(0.12)	11.87	0.03	11.87	7.40	6.16
Custom Cambridge Blend for Real Assets <sup>2</sup>	1.23	19.76	3.72	19.76	9.84	6.70
<b>Real Return</b>	<b>(0.37)</b>	<b>4.01</b>	<b>(1.66)</b>	<b>4.01</b>	<b>7.10</b>	<b>7.72</b>
<b>Real Return Policy Benchmark <sup>2</sup></b>	<b>0.59</b>	<b>20.60</b>	<b>4.53</b>	<b>20.60</b>	<b>11.36</b>	<b>8.67</b>
High Yield Composite	(0.83)	(10.73)	3.65	(10.73)	(0.02)	2.09
Custom High Yield Benchmark	(0.62)	(11.18)	3.50	(11.18)	0.03	2.30
Private Credit	0.14	(1.95)	1.00	(1.95)	6.50	6.45
Bloomberg US Corp HY 1M lag +100bps	2.25	(8.04)	(2.38)	(8.04)	1.93	3.53
Investment Grade Credit Composite	(0.54)	(14.68)	(2.37)	(14.68)	(2.77)	0.46
Custom Investment Grade Credit Benchmark	(0.44)	(14.64)	(2.33)	(14.64)	(2.80)	0.19
<b>Income</b>	<b>(0.33)</b>	<b>(9.04)</b>	<b>0.08</b>	<b>(9.04)</b>	<b>1.26</b>	<b>3.00</b>
<b>Income Policy Benchmark</b>	<b>0.59</b>	<b>(11.51)</b>	<b>(1.53)</b>	<b>(11.51)</b>	<b>(0.40)</b>	<b>1.90</b>
Cash Equivalents <sup>3</sup>	0.35	1.71	1.45	1.71	0.87	1.61
ICE BofA US 3-Month Treasury Bill	0.36	1.46	1.31	1.46	0.72	1.26

<sup>1</sup> Custom index calculated by MSCI based on screening criteria defined by New Jersey Division of Investment. Please see disclosure on page 22.  
<sup>2</sup> Real Return, Real Assets and Real Estate Benchmarks are only reported on a quarterly basis, non quarter-end months are reported as 0%.  
<sup>3</sup> The cash equivalent currently comprises three Common Pension Fund cash accounts. In addition to the seven non cash accounts.

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## Overview of Investments

continued

### Private Equity

The Fund's private equity portfolio is designed to generate long-term returns that exceed those of public equities through participation in private equity investments. Closed-end funds and co-investments managed by specialized investment managers are the two primary structures utilized to invest in private companies. The Fund seeks to partner with the very best private equity investors, including emerging and diverse managers, across various investment strategies and geographies, international managers who have expertise to source attractive opportunities in global markets, and with local managers that focus their investments within New York State (In-State Investment Program). The Fund also seeks to commit capital to industry sectors, such as technology, that show high potential for economic growth and capital appreciation, and that will further enhance the diversification of the portfolio.

Because private equity investments involve long-term contractual commitments to a manager, the Fund will seek to invest with managers who have demonstrated the capacity to consistently deliver superior returns. The Fund can better achieve such superior returns through active portfolio monitoring, which requires frequent and direct interaction with investment managers to monitor performance and ensure proper alignment of interests between manager and investor.

During FY 2022, the CRF private equity portfolio invested in 22 private equity funds for a total of \$4.28 billion in total commitments. In addition to fund investments, the private equity program seeks to exploit those long-term commitments and alignments of interests by making co-investments alongside select managers on improved economic terms. The Fund made 55 co-investments totaling over \$706 million in invested capital in portfolio companies alongside Fund managers. The Fund has established equity co-investment programs focused on opportunities sourced from its core private equity portfolio, the Emerging Manager Program, the In-State Investment Program and its Israel investment program.

For the fiscal year, the CRF private equity program generated a 37.57 percent return as compared to the benchmark return of 39.92 percent. While the performance trails the Cambridge U.S. Private Equity Index benchmark (1Q Lag), the CRF's Private Equity Program is a global investment program, so the Cambridge benchmark is an imperfect comparison.

The private equity portfolio's target allocation, as of March 31, 2022, is 10.00 percent while the actual allocation is 13.64 percent. Over the five-year period, the private equity portfolio has generated a return of 19.93 percent, in contrast to the benchmark return of 20.44 percent over the same time frame. As noted above, this is due to the imperfect benchmark comparison.

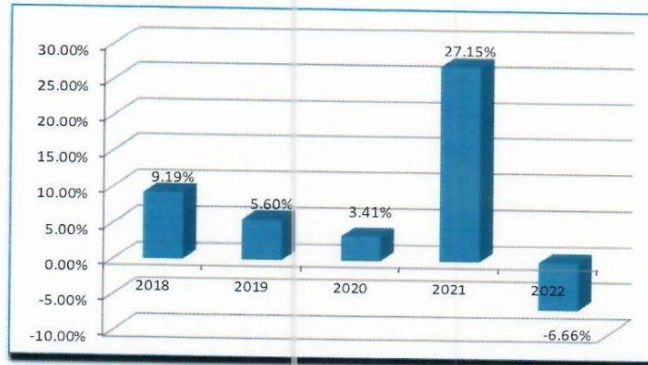
### Real Estate

The real estate portfolio seeks to create a diversified real estate portfolio across various property sectors, geographic locations, and risk profiles, including core and non-core (core-plus/value-add and opportunistic) strategies. At this point in the economic cycle, the Real Estate team is focused on managing volatility while meeting its long-term investment objectives. The real estate allocation's mandate to the overall Fund is to provide the following:

- Long-term net annualized internal rate of return of 7.20 percent composed of a steady stream of income through less risky, core investments, and excess returns through riskier, core-plus/value-add and opportunistic investments;
- Low correlation to other asset classes within CRF's portfolio;
- Periodic liquidity; and
- Inflation hedge.

**North Dakota Public Employees Retirement System – Investment Section  
Investment Results**

**Public Employees and Highway Patrolmen's  
Retirement Systems Investment Results**



**Public Employees and Highway Patrolmen's Retirement Systems (PERS)  
Schedule of Investment Results<sup>(1)</sup>  
For the Five Years Ended June 30, 2022**

	2018	2019	2020	2021	2022	Annualized	
						3 Year	5 Year
Total Fund (PERS)	9.19%	5.60%	3.41%	27.15%	-6.66%	7.07%	7.18%
Actual Total Fund Policy Benchmark	3.09%	6.02%	3.21%	25.84%	-7.04%	6.48%	6.74%
Global Equity	10.52%	3.04%	-7.14%	43.33%	-13.21%	4.93%	5.64%
MSCI World	11.09%	6.33%	2.84%	39.04%	-14.34%	7.00%	7.67%
Large Cap Domestic Equities	15.99%	10.13%	12.98%	42.57%	-12.72%	12.03%	12.42%
Russell 1000	14.54%	10.02%	7.48%	43.07%	-13.04%	10.17%	11.00%
Small Cap Domestic Equities	17.69%	3.00%	-4.48%	40.81%	-16.93%	3.77%	6.25%
Russell 2000	17.57%	-3.31%	-6.63%	62.02%	-25.20%	4.21%	5.17%
Developed International Equities	10.30%	-0.88%	-0.57%	37.48%	-20.00%	3.03%	3.64%
Benchmark <sup>(2)</sup>	7.04%	1.29%	-5.42%	33.60%	-16.76%	1.70%	2.66%
Emerging Markets Equities	9.46%	0.42%	1.44%	46.48%	-28.22%	2.17%	3.23%
MSCI Emerging Markets Net	8.20%	1.22%	-3.39%	40.90%	-25.28%	0.57%	2.18%
Private Equity <sup>(3)</sup>	5.27%	8.62%	3.05%	48.81%	11.73%	19.66%	14.40%
Investment Grade Fixed Income	1.60%	8.13%	9.68%	1.51%	-10.66%	-0.18%	1.79%
Bloomberg Aggregate	-0.40%	7.87%	8.74%	-0.33%	-10.29%	-0.93%	0.88%
Below Investment Grade Fixed Income	5.25%	6.93%	1.10%	14.41%	-0.78%	4.70%	5.25%
Bloomberg High Yield Corp 2% Issuer Cap	2.62%	7.48%	0.00%	15.34%	-12.82%	0.18%	2.09%
Global Real Estate	7.70%	6.02%	2.20%	8.91%	24.96%	11.63%	9.70%
NCREIF Total	7.19%	6.51%	2.69%	7.37%	21.45%	10.22%	8.86%
Timber	-2.52%	4.10%	6.28%	4.87%	7.37%	6.17%	3.96%
NCREIF Timber	3.57%	2.95%	0.34%	3.10%	12.01%	5.03%	4.32%
Infrastructure	7.37%	5.12%	4.47%	14.49%	8.26%	8.99%	7.88%
Benchmark	3.09%	3.91%	1.62%	5.26%	18.33%	8.17%	6.28%
Cash	1.47%	2.31%	1.50%	0.11%	0.22%	0.61%	1.12%
90 Day T-bills	1.36%	2.31%	1.63%	0.09%	0.17%	0.63%	1.11%

<sup>(1)</sup>The investment return calculations were prepared using a monthly time-weighted rate of return methodology based upon market values

<sup>(2)</sup>MSCI EAFE through 6/30/16 and MSCI World ex-US thereafter.

<sup>(3)</sup>It has been determined that there is no benchmark that is an accurate reflection of the System's investments in this asset class. For total fund policy purposes, the actual asset class return is used.

# Annual Comprehensive Financial Report

For the Fiscal Year Ended June 30, 2022

## OREGON PERS

PUBLIC EMPLOYEES RETIREMENT SYSTEM

**Oregon Public Employees  
Retirement System**

An Agency of the  
State of Oregon



## Investment Section

Oregon

### Investment Results\*

	Periods Ended June 30, 2022		
	1-Year	Annualized	
		3-Year	5-Year
Total Portfolio, Excluding Variable Account OPERF Policy Benchmark <sup>1</sup>	6.32 % (0.66)	10.30 % 8.95	9.36 % 8.65
Variable Account Benchmark: MSCI All Country World Investable Market Index Net	(16.21) (16.52)	6.31 5.98	7.05 6.70
Domestic Stocks Benchmark: Russell 3000 Index	(12.92) (13.87)	8.61 9.77	9.18 10.60
International Stocks Benchmark: MSCI All Country World ex-US Investable Market Index Net	(16.47) (19.86)	4.62 1.55	4.59 2.50
Fixed Income Segment Benchmark: Oregon Custom Index <sup>2</sup>	(9.05) (10.12)	(0.25) (0.86)	1.33 0.92
Risk Parity <sup>3</sup> Benchmark: S&P Risk Parity - 12% Target Volatility	(12.95) (6.67)	n/a n/a	n/a n/a
Real Estate Benchmark: Oregon Custom Real Estate Benchmark <sup>4</sup>	29.61 27.26	13.61 10.30	11.02 8.90
Private Equity Benchmark: Russell 3000 Index + 300 bps (Adj.) <sup>5</sup>	24.23 15.25	21.86 21.74	19.64 18.82
Real Assets <sup>6</sup> Benchmark: Consumer Price Index + 4%	23.15 13.39	9.60 9.16	7.15 8.02
Diversifying Strategies <sup>6</sup> Benchmark: HFRI FOF Conservative Index	17.09 0.13	2.80 4.65	0.68 4.03
Opportunity Portfolio Benchmark: Consumer Price Index + 5%	10.19 14.47	13.04 10.20	9.92 9.06

The rates of return reported in the Investment Section are based on a time-weighted rate of return methodology based upon market values, unless disclosed otherwise in the footnotes to the associated tables.

<sup>1</sup>From July 1, 2016 to March 31, 2018 the policy benchmark was 20% Russell 3000+300 Bps quarter lag, 22.5% Oregon Custom FI Benchmark, 12.5% Oregon Custom Real Estate Benchmark, 40% MSCI ACWIIMI Net and 5% CPI+4%. From April 1, 2018 to December 31, 2018 the policy benchmark was 19% Russell 3000+300 Bps quarter lag, 22% Oregon Custom FI Benchmark, 12.5% Oregon Custom Real Estate Benchmark, 39% MSCI ACWIIMI Net and 7.5% CPI+4%. From January 1, 2019 to June 30, 2020 the policy benchmark was 19% Russell 3000+300 Bps quarter lag, 21% Oregon Custom FI Benchmark, 12.5% Oregon Custom Real Estate Benchmark, 37.5% MSCI ACWIIMI Net and 10% CPI+4%. From July 1, 2020 to September 30, 2021 the policy benchmark was 19% Russell 3000+300Bps quarter lag, 20% Oregon Custom FI Benchmark, 12.5% Oregon Custom Real Estate Benchmark, 33.5% MSCI ACWIIMI Net, 12.50% CPI+4%, and 2.50% S&P Risk Parity - 12% Target Volatility. From October 1, 2021 to Present the policy benchmark is 20% Russell 3000+300 Bps quarter lag, 20% BBG U.S. Aggregate, 12.50% NCRIF ODCE (Custom), 30% MSCI ACWIIMI Net, 7.50% CPI+4%, 7.50% HFRI FOF Conservative Index and 2.50% S&P Risk Parity - 12% Target Volatility.

<sup>2</sup>From March 1, 2016 to September 30, 2021, index was 46% BBG Aggregate Bond, 37% BBG Treasury, 13% S&P LSTA and 4% BofA ML High Yield Master II. From October 1, 2021 to Present, index is 100% Bloomberg U.S. Aggregate.

<sup>3</sup>Inception date is May 1, 2020.

<sup>4</sup>Starting July 1, 2017, methodology for monthly return is calculated by geometrically linking prior months returns, and then deriving the monthly returns by calculating the geometric average. Returns are not actual monthly, but rather equivalent for all intra-quarter months, in order to match the actual quarterly return.

<sup>5</sup>From July 1, 2017, the monthly return is calculated as the geometrically linked monthly-portion of the quarterly return. Returns are not actual monthly, but rather equivalent for all intra-quarter months, in order to match the actual quarterly return.

<sup>6</sup>Beginning October 1, 2021, the Alternatives Portfolio has been split up into new portfolios: Real Assets and Diversifying Strategies.

\* Investment Results are based upon OIC asset classes as determined by each manager's primary investment type, not the financial statement classification of individual holdings.

# PSERS' Performance (Net of Fees)

## As of September 30, 2022

Asset Class	Quarter	Fiscal Year to Date*	1 Year	3 Years (Annualized)	5 Years (Annualized)	10 Years (Annualized)
Equities						
Public Equity	(6.74%)	(6.74%)	(22.10%)	3.98%	4.68%	8.34%
Private Equity <sup>(1)</sup>	(2.47)	(2.47)	8.30	20.40	17.17	13.50
Fixed Income	(4.25)	(4.25)	(11.20)	(0.12)	3.06	3.93
Real Assets						
Public Real Assets	(7.31)	(7.31)	(3.06)	1.10	1.71	N/A
Private Real Assets <sup>(1)</sup>	0.92	0.92	27.05	17.07	N/A	N/A
Absolute Return	2.14	2.14	11.19	7.40	5.81	4.79
TOTAL FUND	(4.51%)	(4.51%)	(5.22%)	6.43%	6.79%	7.01%

\*PSERS' Fiscal Year ends on June 30

(1) Private market assets are reported on a quarter lag



## South Carolina Retirement Systems Schedule of Investment Results Combined Investment Portfolio

Schedule of Investments	FYE 2022	3 Fiscal Years	5 Fiscal Years	10 Fiscal Years
South Carolina Plan Return (Net of Fees) <sup>1</sup>	-0.97%	7.80%	7.38%	7.43%
South Carolina Policy Benchmark <sup>2</sup>	-5.19%	5.94%	6.32%	6.71%
<b>Bonds<sup>3</sup></b>	<b>-7.76%</b>	<b>-0.80%</b>	<b>0.83%</b>	<b>1.40%</b>
Bonds Benchmark <sup>2</sup>	-10.29%	-2.12%	0.27%	1.63%
<b>Private Debt<sup>3</sup></b>	<b>11.63%</b>	<b>7.74%</b>	<b>6.76%</b>	<b>7.73%</b>
Private Debt Benchmark <sup>2</sup>	4.75%	5.73%	5.52%	5.38%
<b>Private Equity<sup>3</sup></b>	<b>29.85%</b>	<b>20.52%</b>	<b>16.88%</b>	<b>15.00%</b>
Private Equity Benchmark <sup>2</sup>	23.46%	22.50%	18.63%	16.67%
<b>Public Equity<sup>3</sup></b>	<b>-16.12%</b>	<b>6.10%</b>	<b>6.56%</b>	<b>8.41%</b>
Public Equity Benchmark <sup>2</sup>	-16.52%	5.86%	6.61%	8.53%
<b>Real Assets</b>	<b>25.42%</b>	<b>12.77%</b>	<b>11.21%</b>	<b>13.07%</b>
Real Assets Benchmark <sup>2</sup>	28.36%	10.73%	9.45%	6.87%
<b>Portable Alpha<sup>4</sup></b>	<b>11.47%</b>	<b>8.93%</b>	<b>6.33%</b>	<b>6.74%</b>
HFRI FOF: Conservative ex LIBOR	-0.46%	3.82%	2.66%	2.90%

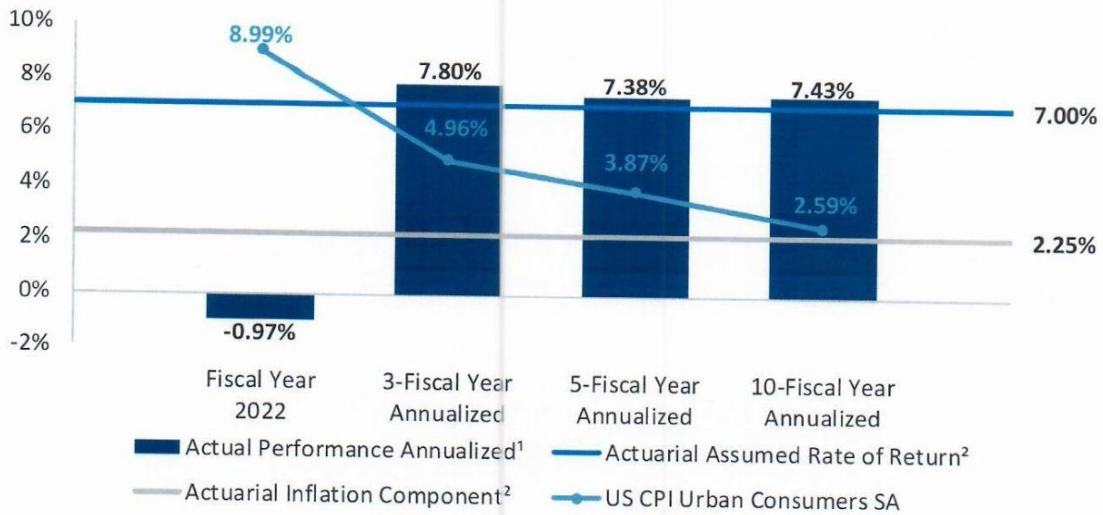
<sup>1</sup> Plan returns are from BNY Mellon and are time-weighted, total return calculations, net of fees and expenses. All returns are expressed in U.S. dollars. Periods greater than one year are annualized. Total Plan trailing periods reflect a performance correction that affected the time period 03/31/2015 through 06/30/2022.

<sup>2</sup> The Policy Benchmark is set annually by the RSIC and has changed over time. The presented returns are a blend of previous policies. Asset class benchmarks represent current policy benchmarks blended with past policy benchmarks which may have changed over time.

<sup>3</sup> Returns generated from synthetic exposure through the Overlay Program are blended into the asset class segment returns.

<sup>4</sup> Portable Alpha Hedge Funds are expressed as gross exposure but, as collateral supporting the Overlay Program, net to zero when calculating total Plan fair value. 3, 5 and 10 year Portable Alpha hedge fund returns are considered supplemental information provided by Staff to illustrate performance of these hedge funds even though they were classified under a different asset class during these periods. The cost of holding these assets is proxied using 3 month LIBOR and the performance presented is excess of LIBOR.

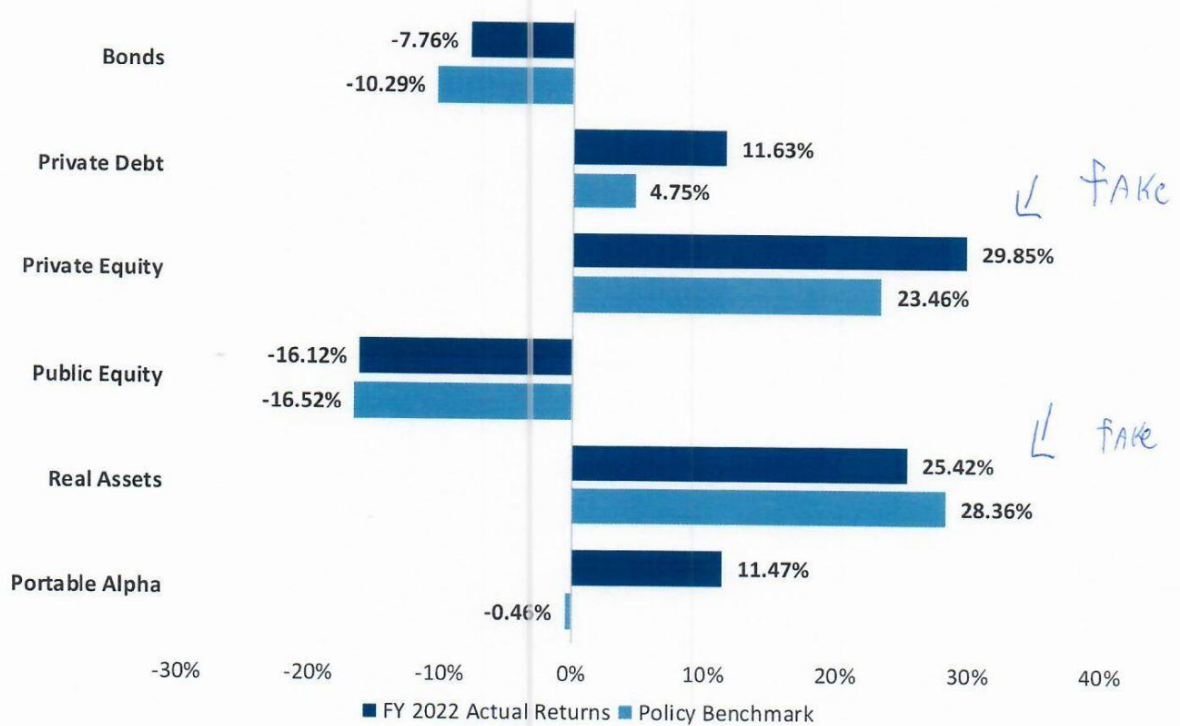
## South Carolina Retirement Systems Investment Performance Summary



<sup>1</sup> Plan returns are provided by BNY Mellon and are presented on a time-weighted calculation basis, net of fees. All returns are expressed in U.S. dollars. Periods greater than one year are annualized. Total Plan trailing periods reflect a performance correction that affected the time period 03/31/2015 through 06/30/2022.

<sup>2</sup> The actuarial assumed rate of return was set at 7.50 percent, net of investment expense, for fiscal years 2011 through 2017, 7.25 percent for fiscal years 2018 through 2021, then 7 percent beginning with fiscal year 2021. The rate was composed of 2.75 percent inflation and 4.75 percent real rate of return through fiscal year 2016; 2.25 percent inflation and 5.25 percent real return for fiscal year 2017; 2.25 percent inflation and 5.00 percent real return for fiscal years 2018 through 2021, and 2.25 percent inflation and 4.75 percent real return beginning with fiscal year 2021.

### Fiscal Year 2022 Investment Performance by Market Segment





INVESTMENT PERFORMANCE REVIEW



Tennessee

TRGT INVESTMENT PERFORMANCE REVIEW

Periods Ending June 30, 2022

	Current Year	Annualized Returns	
		3-Year	5-Year
Pension Plan Portfolio	-3.63%	8.30%	8.12%
Policy Index (1)	-5.62%	7.16%	7.37%
As-Allocated Index	-5.13%	7.30%	7.34%
Domestic Equity	-11.20%	9.70%	10.22%
S & P 1500 Index	-11.02%	10.29%	10.92%
Canadian Equity	-5.99%	9.48%	8.72%
S & P TSX 60 Index	-6.32%	9.20%	8.62%
Domestic Fixed Income	-14.59%	-1.55%	1.07%
FTSE LPF Index	-15.01%	-1.79%	0.82%
International Developed Equity	-19.80%	2.60%	3.53%
International Developed Equity Index	-18.75%	1.06%	2.12%
International Emerging Mkts Equity	-19.53%	2.65%	2.46%
International Emerging Mkts Custom Index	-20.96%	2.88%	2.74%
Real Estate	37.42%	15.36%	12.79%
NCREIF ODCE Index	28.06%	11.43%	9.63%
Private Equity	26.46%	31.54%	26.88%
Private Equity Custom Index	28.29%	26.97%	19.07%
Strategic Lending Portfolio	3.40%	6.95%	6.85%
SL Benchmark	-7.82%	1.14%	2.56%

Verus

Ranking of TCRS Portfolio	Percentile Rankings	Risk Adjusted Basis
Last three years	15	21
Last five years	17	20

The percentile ranking is the position of the TRGT portfolio as compared with other public funds with one being the best and 100 being the worst. The investment performance for TRGT was computed using a market, time weighted rate of return by an independent consultant.

(1) Effective 10/1/21, Policy Index is 31% S&P 1500/ 2% S&P TSX 60/ 12% MSCI EAFE IMI net/ 4% MSCI Emerging Markets net -0.50%/ 20% FTSE LPF/ 10% NCREIF 1Q Lag/ 10% Cambridge custom/ 10% Strategic Lending/ 1% FTSE T-Bill 1 Month.

## Defined Benefit Investments (Continued)

Comparative Investment Results <sup>(1)(2)(3)</sup>

Year Ended December 31, 2021

Investment Option Comparative Index	1 Year	3 Year	5 Year	10 Year
<b>Global Equity*</b>	<b>18.23 %</b>	<b>19.59 %</b>	<b>13.21 %</b>	<b>12.24 %</b>
FSTE Global All Cap Net Index	18.06	20.15	14.05	11.98
<b>Global Debt Securities*</b>	<b>0.45</b>	<b>6.17</b>	<b>4.45</b>	<b>3.91</b>
Fund Benchmark	0.21	5.46	4.00	3.41
<i>Benchmark consisting of:</i>				
60% Bloomberg U.S. Aggregate Bond Index				
15% Bloombergs Global Aggregate Bond Index Hedged				
25% Bloomberg World Government Inflation-Linked Bond Index Hedged				
<b>Real Assets**</b>	<b>21.53</b>	<b>8.17</b>	<b>9.36</b>	<b>9.72</b>
U.S. Consumer Price Index + 5%	12.81	8.82	8.08	7.12
<b>Private Equity</b>	<b>56.88</b>	<b>36.90</b>	<b>29.37</b>	<b>21.86</b>
Private Equity Benchmark				
Russell 3000 + 2.5%	28.19	28.56	20.67	18.93
<b>Absolute Return</b>	<b>7.95</b>	<b>7.11</b>	<b>5.80</b>	<b>5.56</b>
3-month Treasury Bills + 5.0%	5.05	5.99	6.14	5.63
<b>Short Term</b>	<b>(0.02)</b>	<b>2.31</b>	<b>1.93</b>	<b>1.07</b>
3 Month Treasury Bills	0.05	0.99	1.14	0.63
<b>Total Fund***</b>	<b>17.46</b>	<b>14.94</b>	<b>11.48</b>	<b>10.28</b>
Fund Benchmark	12.63	14.59	10.93	9.43
<i>Benchmark consisting of:</i>				
37% FTSE Global All Cap Index				
16% 3-month Treasury Bill + 5%				
15% CPI-W+5%				
12% Bloomberg U.S. Aggregate Bond Index				
12% Russell 3000 Index + 2.5%				
5% Bloomberg World Government Inflation-Linked Bond Index Hedged				
3% Bloomberg Global Aggregate Bond Index Hedged				
CAI Public Fund — Very Large Database Median	16.28	15.00	11.53	10.07
<b>Inflation</b>	<b>7.81</b>	<b>3.82</b>	<b>3.08</b>	<b>2.12</b>

(1) Investment measurement services provided by Callan Associates Inc.

(2) Total rates of return include cash income plus gains and losses due to changes in fair value, where realized or unrealized.

(3) Investment return calculations were prepared using a time-weighted return except private equity which is prepared using a dollar weighted return.

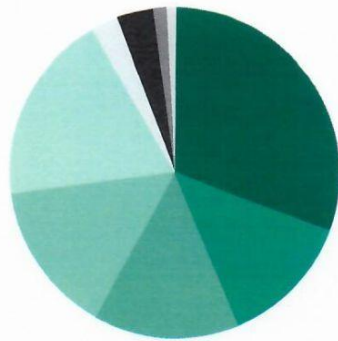
\*Global equity and fixed income returns are reported at gross for comparability to the benchmarks which are reported as gross of fees. All other returns are reported a net of fees.

\*\*The non real estate portion of Real Assets only reflects returns for years 1, 3 and 5. Year 10 is for real estate only using a NCREIF Total Index Benchmark.

\*\*\*Total fund return is blended based upon gross returns for global equity and fixed income and net returns for Real Assets, Absolute Return, Short Term and Private Equity. Total fund net return is 17.29%, 14.78%, 11.31% and 10.09% for 1, 3, 5 and 10 year periods.

Virginia

**FIGURE 3.1: ASSET ALLOCATION MIX**  
AS OF JUNE 30, 2022



- Public Equity**
  - 30.4% Global Equity
- Fixed Income**
  - 13.1% Fixed Income
- Credit Strategies**
  - 14.3% Credit Strategies
- Real Assets**
  - 14.9% Real Assets
- Private Equity**
  - 18.8% Private Equity
- Private Investment Partnerships**
  - 2.6% Private Investment Partnerships
- Multi-Asset Public Strategies**
  - 3.6% Multi-Asset Public Strategies
- Exposure Management Portfolio (EMP)**
  - 1.3% EMP
- Cash**
  - 1.0% Cash

**FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY**  
ANNUALIZED DATA FOR THE PERIOD ENDING JUNE 30, 2022

	1 Year	3 Years	5 Years	10 Years
<b>1. Total Fund</b>				
VRS	0.6%	9.2%	8.3%	8.7%
VRS Custom Benchmark <sup>1</sup>	-5.5%	6.1%	6.6%	7.5%
<b>2. Total Public Equity</b>				
VRS	-14.8%	6.1%	6.3%	9.0%
Custom Benchmark <sup>2</sup>	-16.2%	6.3%	6.9%	8.9%
<b>3. Total Fixed Income</b>				
VRS	-10.6%	0.3%	1.8%	2.3%
Custom Benchmark <sup>3</sup>	-11.0%	-1.1%	0.8%	1.5%
<b>4. Total Credit Strategies</b>				
VRS	1.5%	6.4%	6.3%	6.6%
Custom Benchmark <sup>4</sup>	-6.5%	1.8%	3.3%	4.7%
<b>5. Total Real Assets</b>				
VRS	21.7%	11.0%	10.1%	10.9%
Custom Benchmark <sup>5</sup>	18.0%	8.7%	8.1%	9.1%
<b>6. Total Private Equity</b>				
VRS	27.4%	25.5%	21.2%	17.5%
Custom Benchmark <sup>6</sup>	6.7%	15.7%	14.4%	13.7%
<b>7. Total Private Investment Partnerships</b>				
VRS	17.0%	12.7%	11.1%	N/A
Custom Benchmark <sup>7</sup>	6.9%	9.5%	9.2%	N/A
<b>8. Total Multi-Asset Public Strategies</b>				
VRS	-4.7%	3.6%	N/A	N/A
Custom Benchmark <sup>8</sup>	-8.2%	3.6%	N/A	N/A

Investment return calculations were prepared using a time-weighted return methodology based on market value, net of investment expenses.

Virginia

## Report on Investment Activity (cont.)

### Returns for the CTF Based on Total Fund and Asset Class

Periods Ending June 30, 2022

	1-Year	3-Year	5-Year	10-Year
<b>Total Fund</b>	5.39 %	12.04 %	10.93 %	10.44 %
Passive Benchmark	(14.52)%	4.29 %	5.36 %	6.94 %
<b>Fixed Income</b>	(10.56)%	(0.19)%	1.66 %	2.24 %
Bloomberg Universal	(10.89)%	(0.94)%	0.94 %	1.83 %
<b>Tangible</b>	11.11 %	8.67 %	6.65 %	5.46 %
CPI Lagged One Quarter + 400 bp	12.56 %	8.20 %	7.36 %	6.32 %
<b>Real Estate</b>	40.81 %	19.84 %	16.52 %	14.80 %
8% Return Over Rolling 10 Years	n/a	n/a	n/a	8.00 %
NCREIF Lagged One Quarter (for Comparison Purposes)	21.87 %	9.60 %	8.54 %	9.61 %
<b>Public Equity</b>	(16.01)%	6.03 %	7.07 %	9.23 %
MSCI ACWI IMI w/U.S. Gross and Custom Historical Blend	(16.31)%	6.27 %	7.01 %	9.03 %
<b>Private Equity</b>	19.93 %	23.01 %	19.51 %	16.28 %
Russell 3000 Lagged One Quarter + 300 bp	9.55 %	16.81 %	14.69 %	13.28 %
<b>Innovation</b>	16.95 %	12.63 %	(1.38)%	2.50 %
Custom Benchmark	0.87 %	10.76 %	9.80 %	5.27 %
<b>Cash</b>	0.24 %	0.65 %	1.17 %	0.73 %
90-Day T-Bills	0.17 %	0.63 %	1.12 %	0.65 %

### Performance

The chart above shows the time-weighted rates of return for the CTF on a total fund basis as well as by asset class. Appropriate benchmark returns are provided for comparison purposes.

Performance information is compiled by the custodian, State Street Bank. Performance numbers are reported net of management fees and are prepared using a time-weighted rate of return based on the current fair value.

### Asset Allocation

Investment performance is a result of two primary factors: individual asset selection and the allocation of the portfolio among asset classes (for example, stocks, fixed income and real estate). Studies suggest that more than 90% of investment performance can be explained by asset allocation decisions.

Accordingly, the WSIB sets a specific, long-term target asset mix and adopts tight ranges around those targets to control the overall risk and return of the CTF. On a daily basis, the WSIB reviews the asset allocation in relation to the established ranges. Its staff has the ability to adjust assets when the

allocation range for an asset exceeds the approved range or when cash is needed elsewhere.

The WSIB reviews changes to the overall asset mix every three to four years.

The chart below shows the CTF's asset allocation as of June 30, 2022, as well as the long-term target allocations.

### Current Asset Allocation and Long-Term Target Allocations — As of June 30, 2022

Asset Type	Target Allocation	Actual Allocation
Fixed Income	19.00 %	18.55 %
Tangible Assets	8.00 %	6.10 %
Real Estate	18.00 %	21.00 %
Public Equity	30.00 %	24.23 %
Private Equity	25.00 %	29.28 %
Innovation	0.00 %	0.79 %
Cash	0.00 %	0.05 %
<b>Total</b>	<b>100.00 %</b>	<b>100.00 %</b>

### Public Equity

The public equity program uses a global benchmark, the Morgan Stanley All Country World with U.S. Gross Investable Market Index, reflecting the globalization of capital markets. Since many U.S. companies like Coca-Cola get much of their revenue



**West Virginia Consolidated Public Retirement Board**  
**Investment Section**  
**Investment Pool Objectives, Financial Highlights, and Performance**

**PRIVATE MARKETS POOL (Continued)**

**FINANCIAL HIGHLIGHTS (in \$000s) (continued)**

Investment Breakdown:	Fair Value	Percentage of Securities
Corporate bonds	\$ 10,767	0.2%
Equity investments	237,821	3.9%
Money market mutual fund	113,410	1.9%
Private credit & income funds	735,089	12.0%
Private equity partnerships	2,757,816	45.0%
Private real estate partnerships and funds	2,220,924	36.2%
Securities lending collateral	51,390	0.8%
<b>Total</b>	<b>\$ 6,127,217</b>	<b>100.0%</b>

**Progression of Net Position:**

Net position - June 30, 2021	\$ 5,920,744
Net investment income (loss)	654,452
Net increase (decrease) from unit transactions	(486,421)
<b>Net position - June 30, 2022</b>	<b>\$ 6,088,775</b>

**INVESTMENT PERFORMANCE**

The IMB calculates total rates of return using the time-weighted rate of return methodology. The time-weighted method determines the rate of return exclusive of the effects of participant contributions or withdrawals. Actual rates of return are net of external investment management and/or partnership fees and expenses.

	Private Credit & Income		Private Equity		Real Estate	
	Actual	Credit Suisse Leveraged Loan plus 200 basis points **	Actual	Russell 3000 plus 300 basis points*	Actual	NCREIF Property Index plus 100 basis points
One-year	7.3%	-0.7%	8.6%	-10.9%	16.4%	22.9%
Three-year	7.1%	4.0%	26.5%	12.8%	9.1%	10.6%
Five-year	6.7%	5.0%	24.3%	13.6%	8.8%	9.6%
Ten-year	N/A	N/A	19.0%	15.7%	9.5%	10.6%

\* Prior to January 2014, the Private Equity index was the S&P 500 plus 500 basis points

\*\* Prior to April 2017, the Opportunistic Income index was the Credit Suisse Leveraged Loan plus 250 basis points.

**LARGEST HOLDINGS (in \$000s)**

Ten Largest Holdings	Fair Value
RREEF America REIT II, Inc.	\$ 324,323
Invesco Core Real Estate - U.S.A., L.P.	291,931
West Virginia Direct Lending LLC	224,084
Harrison Street Core Property Fund, L.P.	184,715
AG Mountain Laurel Direct Lending Fund, L.P.	160,698
UBS Trumbull Property Fund, L.P.	117,710
UBS Trumbull Property Income Fund, L.P.	106,572
RREEF Core Plus Industrial Fund, L.P.	100,401
Invesco Commercial Mortgage Income Fund, L.P.	99,894
CBRE U.S. Credit Partners, L.P.	82,208

A complete listing of the investments in each pool is available at [www.wvimb.org](http://www.wvimb.org).

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## Schedule of Investment Returns

### Schedule of Investment Returns

The following table compare the actual, based on fair value return, for investment categories to the corresponding benchmark time weighted returns.

Schedule of Investment Returns				
The following tables compare the actual, based on fair value return, for investment categories to the corresponding benchmark time weighted returns.				
	2021	3 Year	5 Year	10 Year
<b>Fixed Income Returns</b>				
Total Marketable Fixed Income Portfolio (Net of fees)	0.84%	6.20%	4.47%	4.43%
Custom Marketable Fixed Income Benchmark*	-0.41%	4.91%	3.64%	3.39%
Total Private Debt Portfolio (Net of fees)	33.51%	11.27%	9.10%	10.96%
Cambridge Associates Vintage Year Blended Private Debt Benchmark	21.06%	10.02%	10.13%	n/a
<b>Equity Returns</b>				
Total Marketable Equity Portfolio (Net of fees)	15.29%	19.25%	13.27%	11.13%
Custom Marketable Equity Benchmark*	17.27%	19.21%	13.58%	11.62%
Total Private Equity Portfolio (Net of fees)	59.77%	30.19%	24.06%	n/a
Cambridge Associates Global All PE	47.73%	22.29%	19.72%	n/a
<b>Marketable Alternatives Returns</b>				
Total MA Portfolio (Net of fees)	11.08%	14.22%	10.35%	n/a
HFRI FOF Composite	6.00%	8.42%	5.68%	n/a
<b>Private Market Returns</b>				
Total Real Estate Portfolio (Net of fees)	31.39%	10.12%	9.68%	9.34%
Vintage Year Blend Benchmark	29.41%	8.32%	9.23%	9.49%
<b>TOTAL PORTFOLIO Returns</b>				
Total Portfolio (Net of fees)	17.19%	15.60%	11.22%	9.42%
Strategic Blended Benchmark*	14.57%	13.77%	10.12%	8.69%

\*See WRS Investment Policy Statement Appendix 1 for benchmark composition.