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CHAIR

PEGGY G. BOYKIN, CPA
COMMISSIONER

WILLIAM (BILL) J. CONDON, JR. JD, MA, CPA
COMMISSIONER

EDWARD N. GIOBBE, MBA
COMMISSIONER

RETIREMENT SYSTEM INVESTMENT COMMISSION

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VICE-CHAIR

ALLEN R. GILLESPIE, CFA
COMMISSIONER

WILLIAM (BILL) H. HANCOCK, CPA
COMMISSIONER

REYNOLDS WILLIAMS, JD, CFP
COMMISSIONER

# Commission Meeting Agenda

## Thursday, February 21, 2019 9:30 a.m.

### RSIC Presentation Center

I. Call to Order and Consent Agenda
   A. Adoption of Proposed Agenda
   B. Approval of November Minutes

II. Chair's Report

III. Human Resources & Compensation Committee Report

IV. CEO's Report

V. CIO's Report
   A. 4th Quarter Investment Performance Summary
   B. Fiscal Year 2019 AIP Progress Report

VI. Executive Session to discuss investment matters pursuant to S.C. Code Sections 9-16-80 and 9-16-320; to discuss personnel matters related to Commission's review of CEO's compensation pursuant to S. C. Code Section 30-4-70(a)(1); and to receive advice from legal counsel pursuant to S.C. Code Section 30-4-70(a)(2).

VII. Potential Actions Resulting from Executive Session

VIII. Delegated Investment Report

IX. Consultant Report
   A. Benchmark Clarification
   B. Survey of Asset Allocaton Practices

X. Asset Allocation Review and Discussion

XI. Adjourn

**NOTICE OF PUBLIC MEETING**

*This notice is given to meet the requirements of the S.C. Freedom of Information Act and the Americans with Disabilities Act. Furthermore, this facility is accessible to individuals with disabilities, and special accommodations will be provided if requested in advance.*

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**South Carolina Retirement System Investment Commission**
**Meeting Minutes**

**November 8, 2018 9:30 a.m.**
**Capitol Center**
**1201 Main Street, 15th Floor**
**Columbia, South Carolina 29201**
**Meeting Location: Presentation Center**

**Commissioners Present:**
Dr. Rebecca Gunnlaugsson, Chair
Dr. Ronald Wilder, Vice Chair
Ms. Peggy Boykin, PEBA Executive Director
Mr. Allen Gillespie
Mr. Edward Giobbe
Mr. Reynolds Williams (via telephone)
Mr. William H. Hancock
Mr. William J. Condon, Jr.

## I. CALL TO ORDER AND CONSENT AGENDA

Chair Dr. Ronald Wilder called to order the meeting of the South Carolina Retirement System Investment Commission ("Commission") at 9:30 a.m. Mr. Edward Giobbe made a motion to approve the proposed agenda as presented. Dr. Rebecca Gunnlaugsson seconded the motion, which was approved unanimously.

The Chair requested a motion to approve the draft minutes from the Commission's meetings held on June 14-15, 2018 and September 13, 2018. The minutes were unanimously approved.

## II. CHAIR'S REPORT

The Chair presented the proposed 2019 Meeting Schedule. Mr. Bill Condon suggested that the Commission meet more frequently in order to have more time to discuss the Annual Investment Plan (AIP) and the Statement of Investment Objectives and Policies (SIOP). Mr. Michael Hitchcock, Chief Executive Officer, suggested providing educational sessions between the meetings or holding a two-day meeting prior to the May statutory deadline to adopt the AIP. After further discussion, Mr. Condon requested that the Commission add February 8, 2019 to the proposed meeting schedule. Mr. Condon moved to amend the motion to adopt the 2019 schedule to add February 8, 2019 as an additional meeting date, which was unanimously approved by the Commission.

## III. FIDUCIARY PERFORMANCE AUDIT REPORT - FUNSTON ADVISORY SERVICES, LLC

The Chair recognized Mr. Rick Funston, Funston Advisory Services, LLC and his Staff which was selected by the State Auditor to perform a statutorily required fiduciary audit of the Commission. Mr. Funston explained that his team had completed their second review of the Commission, the first review was conducted in 2014. He then introduced his team and their roles in the audit.

After the introductions, Mr. Funston reviewed the 2014 Fiduciary Audit Report which contained 126 recommendations with five overall themes. He noted that 110 recommendations have been fully implemented prior to the new audit, with nine substantially implemented. He stated that RSIC now has a strong leadership team lead by Mr. Hitchcock, the Chief Executive Officer who joined RSIC in 2015. He noted that the relationship between the Commission and General Assembly and the Commission and the State Treasurer's Officer had greatly improved under Mr. Hitchcock's leadership. He stated that the Commissioners are now more involved in the strategic implementation of the Plan, rather than the day to day operations of the Commission. The Audit and Enterprise Risk Committee and Human Resource and Compensation Committee had been were both created. He emphasized that the 2017 Chief Investment Officer Delegation Policy was added and had been beneficial to the Commission.

Mr. Funston stated that there was in methods and process to build trust and confidence within the Commission. He suggested that the Enterprise Risk Management position needed to be filled and explained in detail the importance of the enterprise risk function as a holistic approach across the entire agency. A brief discussion ensued regarding the mechanics of an enterprise risk function and different best practices approaches to staffing that function. Each member of Mr. Funston's team then briefly presented their findings for the 2018 Fiduciary Audit Report.

Mr. Funston complimented the Commission on its hard work since the first audit and noted that the new report contained only 52 recommendations to continue to improve and move toward more best practices in various areas. Lastly, the topic of the Commission becoming more strategic in its approach was discussed. Mr. Geoffrey Berg, Chief Investment Officer commented that it is a goal of the Commission to become more strategic at the Commissioner level. After a brief discussion of strategic planning and process, Mr. Funston concluded his report.

**A break was taken from 10:48 a.m. to 11:00 a.m.**

## IV. AUDIT & ENTERPRISE RISK MANAGEMENT COMMITTEE REPORT

The Chair called the meeting back to order and introduced Mr. Hancock to report on the Audit and Enterprise Risk Management Committee. Mr. Hancock thanked the Chair and began his report by recalling that on October 24th he was selected as Chair of the Audit and Enterprise Risk Management Committee. Mr. Hancock noted that the

committee would revisit the chair position on an annual basis. Mr. Hancock then reported that the September 30, 2018 compliance reviews are still in progress, and will be completed by the February meeting of the Commission. Mr. Hancock also noted that the manager compliance questionnaire reviews for fiscal year 2018 were received with a one hundred percent response rate, and that investment and compliance staff has reviewed all the responses.

Mr. Hancock then turned to internal audit matters. He relayed that the Audit and Enterprise Risk Management Committee had received the updates from the fiduciary performance review. Mr. Hancock also stated that CliftonLarsonAllen had been engaged to perform an agreed upon procedures review and the results were reported to the Committee. Mr. Hancock reported that the Commission is now in compliance with the CFA Institute's Global Investment Performance Standards (GIPS) for the year ending June 30, 2018, and will be seeking GIPS verification annually hereafter. Mr. Hancock noted that ACA Performance Services conducted the verification and tested areas around valuation, compliant presentations, composite construction, account returns, and policies and procedures.

Lastly, Mr. Hancock proposed future Audit and Enterprise Risk Management Committee meeting dates for 2019 as March 5th, June 4th, August 27th, and October 29th.

The Chair then asked if there were any comments or questions. Mr. Hitchcock recognized the actions of the Investment Performance and Reporting team for their hard work in achieving GIPS verification, and gave a special thanks to Director of Investment Reporting & Performance, Mr. Jon Rychener, for suggesting the project. Mr. Hitchcock explained that the GIPS verification is the gold standard of performance reporting and that the Commission is one of only a handful of pension funds to achieve that verification.

The Chair then thankedMr. Rychener and his Investment Performance and Reporting team and turned to Mr. Hitchcock and the CEO's report.

## V. CEO'S REPORT

Mr. Hitchcock began his report with a  discussion about the Statement of Investment Objectives and Policies ("SIOP"). Mr. Hitchcock reminded the Commission that he, Mr. Berg and Mr. Robert Feinstein, Managing Director, had been making efforts to substantially improve and update the SIOP. To that regard, Mr. Hitchcock  noted that an updated SIOP had been posted for the Commissioners to review prior to the meeting, but recommended that approval of the SIOP be carried to the next meeting so that Commissioners would have more time to review the significant changes to the SIOP.

The Chair asked for a motion to carry approval of the SIOP over until the February 8th meeting date. Mr. Hancock made the motion, Mr. Condon seconded, and the motion passed unanimously.

Mr. Hitchcock continued with his report and suggested that the Commission consider whether to include in the SIOP an investment objective for the fund to meet a long term assumed rate of return of 7.25 percent. Mr. Allen Gillespie mentioned that he would like the SIOP risk return correlation table to include all the assets in the return table for the sake of internal consistency and to illustrate basic investment principles. Mr. Gillespie also mentioned that he would like to see more time spent on the rebalancing policy in the SIOP and asked Staff to give thought to rebalancing within asset classes versus the current approach. Mr. Gillespie lastly stated that he would like to see a more robust consideration given to how the rebalancing framework should look. Mr. Hitchcock concluded his report by acknowledging Mr. Gillespie's suggestions.

## VI. CIO'S REPORT

The Chair recognized Mr. Berg to provide the CIO's Report. Mr. Berg then introduced Mr. David King, Senior Reporting Officer, to provide the performance update for the first fiscal quarter of the 2018-19 Fiscal Year. Mr. King began by announcing that the Portfolio returned 2.34 percent versus a policy benchmark of 2.53 percent. He reported that $458 million in net benefit payments had been made during the same period, and the Portfolio had gained $721 million from investment performance. Mr. King then provided an update on the Teacher & Employee Retention Incentive ("TERI") Program. Mr. King reported that, of the $458 million of net benefit payments the Plan has recently paid, $373 million constituted outstanding balances from the TERI Program, which are now fully satisfied.

Mr. Condon then inquired about how the conclusion of the TERI Program would impact the Plan's average benefit payments going forward. Mr. Hitchcock responded that the conclusion of the TERI Program would reduce average annual benefit payments. Ms. Peggy Boykin explained that the Plan has in recent years paid out over $3 billion in benefit payments. Of that amount, Ms. Boykin noted that the Plan has received over $2 billion in contributions (employer and employee), with investment returns expected to make up the difference. Ms. Boykin explained that the TERI Program ended on June 30, 2018, and consequently, the TERI Program participants were paid the remainder of their TERI-related benefits during the first quarter of the current FY. She stated that the conclusion of the TERI Program will have an impact on the Plan's cashflow but not the amount of regular retirement benefit payments due. Mr. Berg noted that the net benefit payments for the first quarter of the Fiscal Year were unusually low because additional funds flowed into the Plan as a result of contribution increases enacted by the South Carolina General Assembly. Mr. King stated that the additional funds amounted to more than $100 million. Mr. Berg underscored that the

TERI Program's conclusion reduces cash outflows and provides additional cashflow for new investment opportunities.

Mr. King moved onto a discussion of the Plan's policy targets. He noted that the Plan is currently within all asset allocation ranges set by the Commission and close to the policy targets. Mr. King reviewed the Plan's relative performance noting that (a) fiscal year-to-date, the Plan is in the 60th percentile in the BNYMellon universe rankings, and (b) with respect to the rolling three-year period, the Plan is at the 82nd and 83rd percentiles. Mr. Gillespie asked why the peer rankings were so widely dispersed. Mr. Berg replied that he believes the dispersion is caused by other pension plans carrying high levels of conservative assets as required by statutory limitations.

The Chair then asked Mr. King to consider putting both net benefits and receipts in separate bars in reports to the Commission going forward. The Chair stated that he believed doing so would provide a more accurate picture of the Plan's cashflow. Mr. King concluded his presentation by stating that October was a very volatile month in the equity markets. He explained that the All Country World Index was down almost eight percent and estimated that the performance estimate for the month was down about four percent. Mr. King added that the Plan's fiscal year-to-date return through October stood at approximately negative two percent.

Mr. Berg introduced the next item, a discussion of asset allocation principles. Mr. Berg indicated that the purpose of the discussion was to seek the Commission's feedback and support for RSIC Staff ("Staff") to work in collaboration with Meketa Investment Group ("Meketa") to integrate a fuller set of principles into the asset allocation process. He briefly discussed the current asset allocation planning process, and noted that this approach assumes the existing Portfolio is the optimal asset makeup, which results in broader questions not being asked. In addition, this approach does not answer the question of what is the optimal amount of risk for the Portfolio. Mr. Berg explained that by integrating the Plan's unique characteristics and defining the outcomes that should be avoided, the Plan can establish a risk limit for the Portfolio that will help build an asset allocation more reflective of the Plan's needs. Mr. Hitchcock then asked Mr. James Wingo, Director of Quantitative Solutions, to lead the discussion.

Mr. Wingo began by discussing how risk factors impact the Plan's overall asset allocation and highlighted two key risks. The first risk is that the Plan could be derailed from achieving fully funded status within 30 years. Mr. Wingo explained that focusing on this risk would require tailoring the asset allocation in a specific way. The second risk Mr. Wingo identified was that the Plan could experience net cash outflows equal to a large percentage of the Plan. Mr. Wingo explained that focusing on this second risk would require tailoring the asset allocation in another way. He also explained how other risks could be factored into the asset allocation process. Mr. Wingo suggested that the Commission would benefit from seeing a wide range of possible scenarios

when considering asset allocation, in order to improve the likelihood of achieving the Plan's funding objectives.

Mr. Gillespie stressed the importance of taking a detailed look at the risk scenarios. Mr. Berg responded in the affirmative and stated that the fundamental question is for the Commission to define what really matters for the Plan. Mr. Berg explained that Staff has ideas about downside mitigation, but the Commission ultimately would need to agree on fundamental principles, so that the appropriate principles and parameters could be integrated by Staff and Meketa. He underscored the importance of having this discussion at the current time, given that markets may be coming to the end of a prolonged bull market cycle. Mr. Berg then explained that determining the Commission's overall goals is crucial because the goals of avoiding downside risk and getting the Plan to fully funded status can conflict.

Mr. Wingo explained that the risk framework being presented to the Commission was not a formal recommendation but a lens through which the Commission could think about analyzing its overarching goals. Mr. Wingo emphasized the importance of not focusing too much on one outcome.

Mr. Berg explained how the framework Mr. Wingo discussed factored into the General Assembly's setting of the assumed rate of return in the Act. Ms. Boykin added that, in 2021, a new experience study would be conducted and produce a new recommendation for setting the assumed rate of return. Mr. Berg opined that the General Assembly was very conservative in setting the current assumed rate of return, which improves the chances of the Plan being fully-funded in the long-term. Ms. Boykin stated that one of the Joint Committee on Pension Systems Review's goals was to make progress toward fully funding the Plan and limiting the impact of short-term market volatility. She also stated that it was a goal of the Joint Committee to impose higher contribution rates so that, even if short-term returns were lower in the initial ten years following the passage of the Act, the Portfolio would be fully funded in the 20 years thereafter.

Dr. Gunnlaugsson asked Mr. Wingo how the framework presented would inform decisions if, in another ten years, the Plan remains around 50 percent funded. Mr. Wingo responded that, at that time, the framework would have to be re-forecasted with a new set of assumptions. He cautioned against using the framework to forecast too far into the future because factors included in the assumptions will change over time. Dr. Gunnlaugsson then asked how the framework is useful to the Commission today. Mr. Hitchcock responded that the framework should be useful for the Commissioners from a strategic decision-making standpoint. The framework provides a list of risk factors the Plan should try to avoid and ensures those risk factors are appropriately considered when asset allocation decisions are made.

As the discussion concluded, Mr. Berg noted that, ultimately, asset allocation is a balancing act with multiple factors being considered within the constraints of what is statutorily permissible for the Plan. Mr. Hitchcock stated he would like this framework to be flexible enough to glean intelligence from what other pension plans are doing but ultimately make decisions that are the right fit for the Portfolio. The Chair suggested continuing the discussion at the Commission's next meeting and thanked Mr. Wingo and Mr. Berg for the presentation.

In the interests of time, the Chair suggested dispensing with the performance review for the Fiscal Year 2017-18 that was to be provided by Meketa. He stated that the Commissioners could review the materials provided by Meketa following the meeting, and the other Commissioners agreed.

**A break was taken from 12:27 p.m. to 12:41 p.m.**

## VII. CONSULTANT REPORT

The Chair called the meeting back to order and gave the floor to Meketa Consultant Mr. Frank Benham who began a discussion on non-U.S. markets. Mr. Benham introduced the topic with an overview of the pros and cons of investing in assets outside the U.S.

Mr. Benham then shifted to give three reasons why investors should invest outside the U.S.: diversification, growth opportunities, and valuations. Mr. Benham explained each of these reasons to the Commission. He then looked to RSIC's current investments outside the U.S., and stated that RSIC is about 26 percent non-U.S. dollar. Mr. Benham then compared the RSIC plan average with the peer group average of 25 percent non-U.S. dollar, and said that the RSIC plan looks very similar to its peers. Mr. Benham finished the discussion of emerging markets by advising that RSIC continue to invest in emerging markets at its current exposure.

Mr. Giobbe asked whether Meketa's opinion on emerging markets considers a forward-looking approach, including variables like emerging middle classes coming into market power. Mr. Benham replied that Meketa's outlook does include forward looking variables, and replied that U.S. returns are still very strong including the forward-looking variables. Mr. Benham also referenced that an extremely strong dollar is impacting growth in emerging markets.

Mr. Condon then asked whether Meketa looked to public markets or private markets when looking at emerging markets. Mr. Benham replied that Meketa looks at both.

The Chair then asked Mr. Benham if Meketa projected currency fluctuations and in-county performance separately or blended multiple countries performance statistics together in Meketa's projection approach. Mr. Benham replied that they are done together, and caps currency effects at one percent.

Mr. Berg also asked whether Meketa had any long-term conclusions as to U.S. versus non-U.S. equity returns, should RSIC forecast more modest returns for non-U.S. equity, or is there a return to mean? Mr. Benham replied that he is not confident that the price earnings ratio is ever going to return to average, and Meketa does not recommend any changes to RSIC investment levels in emerging markets today.

Mr. Benham then switched to a discussion of currency hedging. Mr. Benham began by explaining that an investment in non-us dollar asset takes on the risk of investing in that currency, and the risk that that currency will fluctuate with the U.S. dollar in both the short term and in the long term. Mr. Benham then showed a chart displaying fluctuations of three percent per year on average.

Next, Mr. Benham discussed the cost of hedging. Mr. Benham said that, in theory, the cost of hedging is the difference between the interest rate in the home country and the foreign country, plus additional costs. Mr. Benham noted that historically, the cost of hedging emerging markets has always been positive, meaning it has always cost money to hedge. Mr. Benham then spoke to whether RSIC would have been better off hedging emerging markets exposure. Mr. Benham displayed a chart that showed that RSIC would have been decidedly better off leaving emerging markets unhedged, but it would have made sense to hedge RSIC's developed market portfolio from a risk return standpoint.

Mr. Benham then considered several methods of hedging if RSIC were to decide to hedge. Mr. Benham first explained that RSIC could have staff implement hedging in-house, however Mr. Benham noted that RSIC may not be currently prepared to perform that function. Mr. Benham also described that hedging could be done by hiring an external manager, have them passively hedge, and set up rules and guidelines. Mr. Benham contrasted passive external currency management managers by saying that active managers would be taking tactical views, which would engender active risk.

Mr. Giobbe then asked Mr. Berg whether RSIC has any significant amount of non-U.S., internally managed assets. Mr. Berg responded that RSIC has Non-U.S. exposure in overlay and exposure in removing currency that RSIC has affirmatively put on to mimic having actual securities in certain markets.

Mr. Berg continued to generally discuss non-U.S. currency hedging and cautioned that if the Commission does consider hedging more deeply, that the hedging would be phased in over several years, and to pick a point in the future to have built a hedge program for a certain percentage of RSIC's developed non-U.S. portfolio. Mr. Berg also cautioned that it would need to be determined exactly which portfolio components would be a candidate for hedging and which components would be less appropriate to hedge. Mr. Berg relayed that RSIC has between 20 and 25 percent non-U.S. asset exposure, and the majority of that is developed non-emerging. Mr. Berg then rephrased

his statement and concluded that RSIC has about 22 percent of its portfolio with currency risk, and the overwhelming majority of that coming from the public equity fund.

Mr. Benham explained that the downsides to hedging are that it will make RSIC look different from its peers, adding additional tracking error and tracking error divergence from RSIC's benchmark-- which would make benchmarks and performance attribution more complex and hard to calculate. Mr. Benham also explained that it might be difficult to explain to RSIC stakeholders. Mr. Benham concluded by saying that from an academic perspective, it makes sense to hedge RSIC developed market exposure, not emerging markets, and that the Commission should think about engaging a strategic hedge for developed markets.

Mr. Berg asked Mr. Benham what the impact of implementing a strategic hedge would be compared to RSIC's peer group over a year long period. Mr. Benham replied that the difference on average has been 30 basis points per year, but it could be as much as 300 or 400 basis points in a given year versus the peer group.

Mr. Giobbe noted that non-U.S. currency markets can be hard to predict, and it might be better off for RSIC to not try to hedge them. Towards that sentiment, Mr. Berg proposed having RSIC staff observe and map out potential hedging strategies. Mr. Hancock agreed and suggested that RSIC staff back test through the different proposed methods. Mr. Gillespie agreed with Mr. Giobbe and said that he is generally against hedging. Mr. Berg said that he would have his team investigate and report back to the Commission in February. Mr. Gillespie reminded the Commission to consider that state-owned businesses may be disproportionately affecting the non-U.S. indexes.

The Chair thanked Mr. Benham and commented that his presentation adds to commissioner education, and it was very helpful. Mr. Gillespie added another comment to Mr. Benham's discussion by saying that it may help to consider individual businesses investments in emerging market countries, as a basis for whether to develop hedges in those countries overall. Mr. Gillespie added that he has seen that business' management teams are currently moving out of the U.S. in accordance with demographic shifts globally.

## VIII. DELEGATED INVESTMENT REPORT

The Chair then recognized Mr. Berg for the delegated investment report. Mr. Berg noted that Staff had recently closed seven new investments. The investments closed and the amounts committed to each are as follows: Providence Equity Partners VIII L.P. ($150 million); Numeric Emerging Markets Small Cap Core Offshore Fund Ltd. (initial investment of $300 million, allocation is up to 1% of Plan assets); Hellman & Friedman Capital Partners IX, L.P. ($60 million); Brookfield Capital Partners V LP ($150 million); Brookfield Strategic Real Estate Partners III-B L.P. ($100 million); Owl

Rock First Lien Fund, L.P. ($200 million); and KKR Lending Partners III L.P. ($215 million) (collectively, the "Delegated Investments"). Mr. Berg referenced the recorded presentation materials for the Delegated Investments and entertained several questions from the Commissioners regarding the debt-related strategies.

## IX. EXECUTIVE SESSION

Mr. Giobbe moved the Commission recede into Executive Session to discuss investment matters pursuant to S.C. Code Sections 9-16-80 and 9-16-320; to discuss personnel matters related to CEO's review of CIO's performance and CEO performance and compensation pursuant to S.C. Code Section 30-4-70(a)(1); and receive advice from legal counsel pursuant to S.C. Code Section 30-4-70(a)(2), which was seconded by Ms. Gunnlaugsson and was unanimously approved.

## X. POTENTIAL ACTION RESULTING FROM EXECUTIVE SESSION

Upon return to open session Mr. Hitchcock noted that the Commission did not take any reportable action while in Executive Session and that any action that did occur while in Executive Session pursuant to S.C. Code Ann §9-16-80 and 9-16-320 would be publicized when doing so would not jeopardize the Commission's ability to achieve its investment objectives or implement a portion of the Annual Investment Plan.

## XI. ADJOURNMENT

The Commission moved to adjourn, which was unanimously approved. The meeting adjourned at 5:46 p.m.

[Staff Note: In compliance with S.C. Code Section 30-4-0, public notice of and the agenda for this meeting was delivered to the press and to parties who requested notice and were posted at the entrance, in the lobbies and near the 15th Floor Presentation Center at 1201 Main Street, Columbia, S.C., at 5:02 p.m. on November 6, 2018]

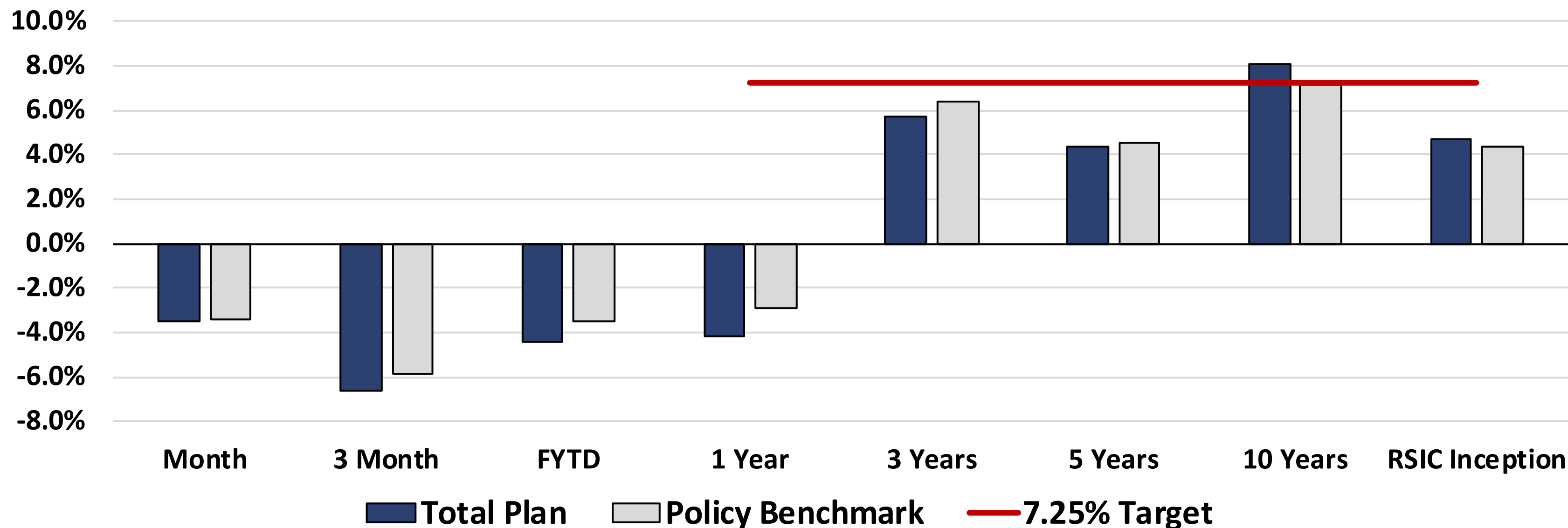
RSIC RETIREMENT SYSTEM INVESTMENT COMMISSION

# Performance Update

RSIC 02/21/19 Commission Meeting
Data as of December 31st, 2018

# Performance - Plan & Policy Benchmark[2]

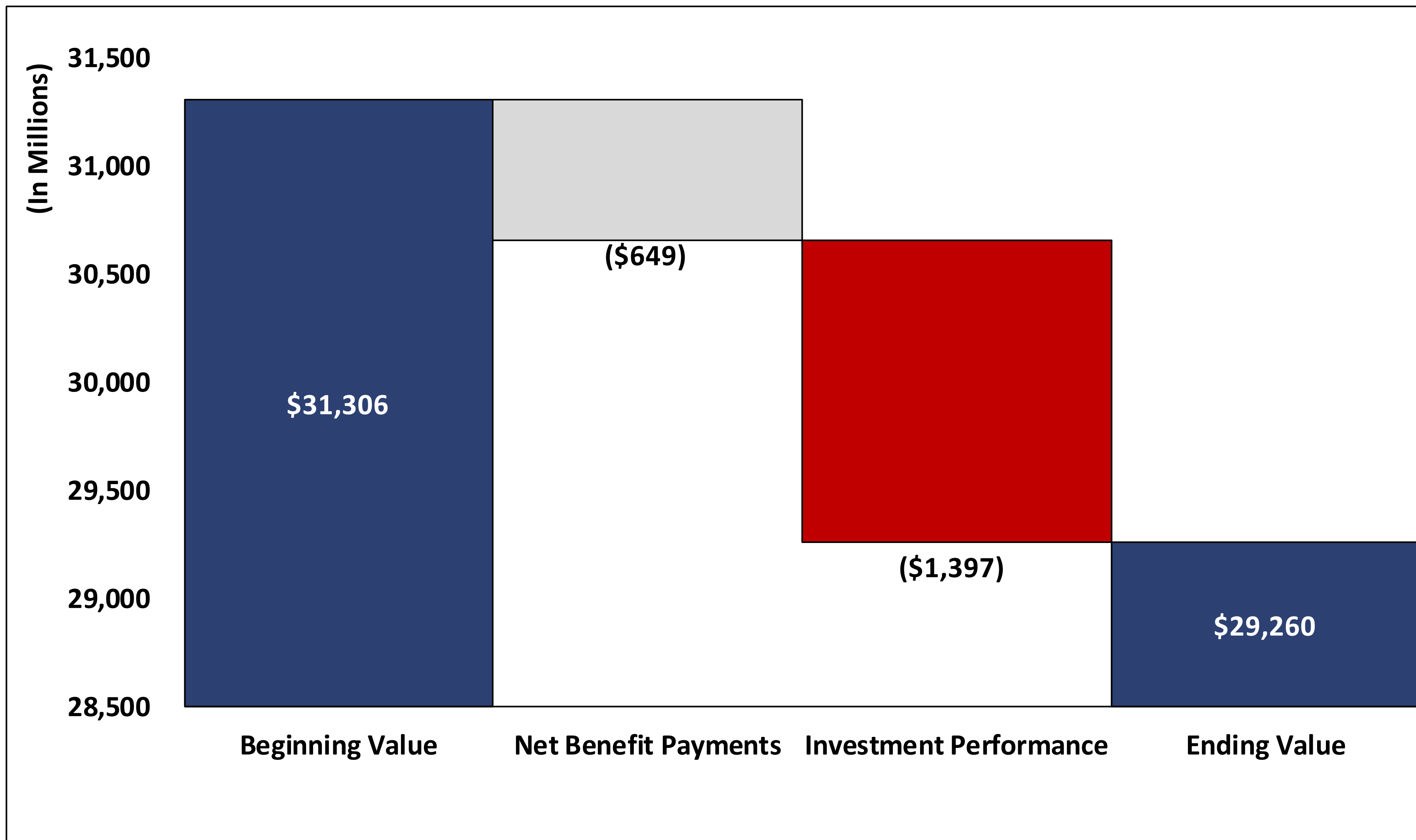
As of December 31, 2018




| Historic Plan Performance As of 12/31/18 | Market Value (In Millions) | Month | 3 Month | FYTD | 1 Year | Annualized 3 Years | 5 Years | 10 Years | RSIC Inception |
|---|---|---|---|---|---|---|---|---|---|
| **Total Plan** | **$29,260** | **-3.51%** | **-6.65%** | **-4.47%** | **-4.20%** | **5.75%** | **4.33%** | **8.06%** | **4.73%** |
| **Policy Benchmark** | | -3.40% | -5.84% | -3.49% | -2.94% | 6.41% | 4.55% | 7.13% | 4.33% |
| **Excess Return** | | -0.11% | -0.81% | -0.98% | -1.26% | -0.67% | -0.22% | 0.93% | 0.40% |
| **Net Benefit Payments (In Millions)** | | ($39) | ($191) | ($649) | ($1,231) | ($3,443) | ($5,579) | ($10,328) | ($13,035) |
| **Current 3-month Roll off Return:** | | | *2.34%* | *N/A* | *3.54%* | *1.11%* | *4.29%* | *-16.12%* | *N/A* |
| **Next 3-month Roll off Return:** | | | *-6.65%* | *N/A* | *0.05%* | *0.49%* | *2.21%* | *-3.07%* | *N/A* |

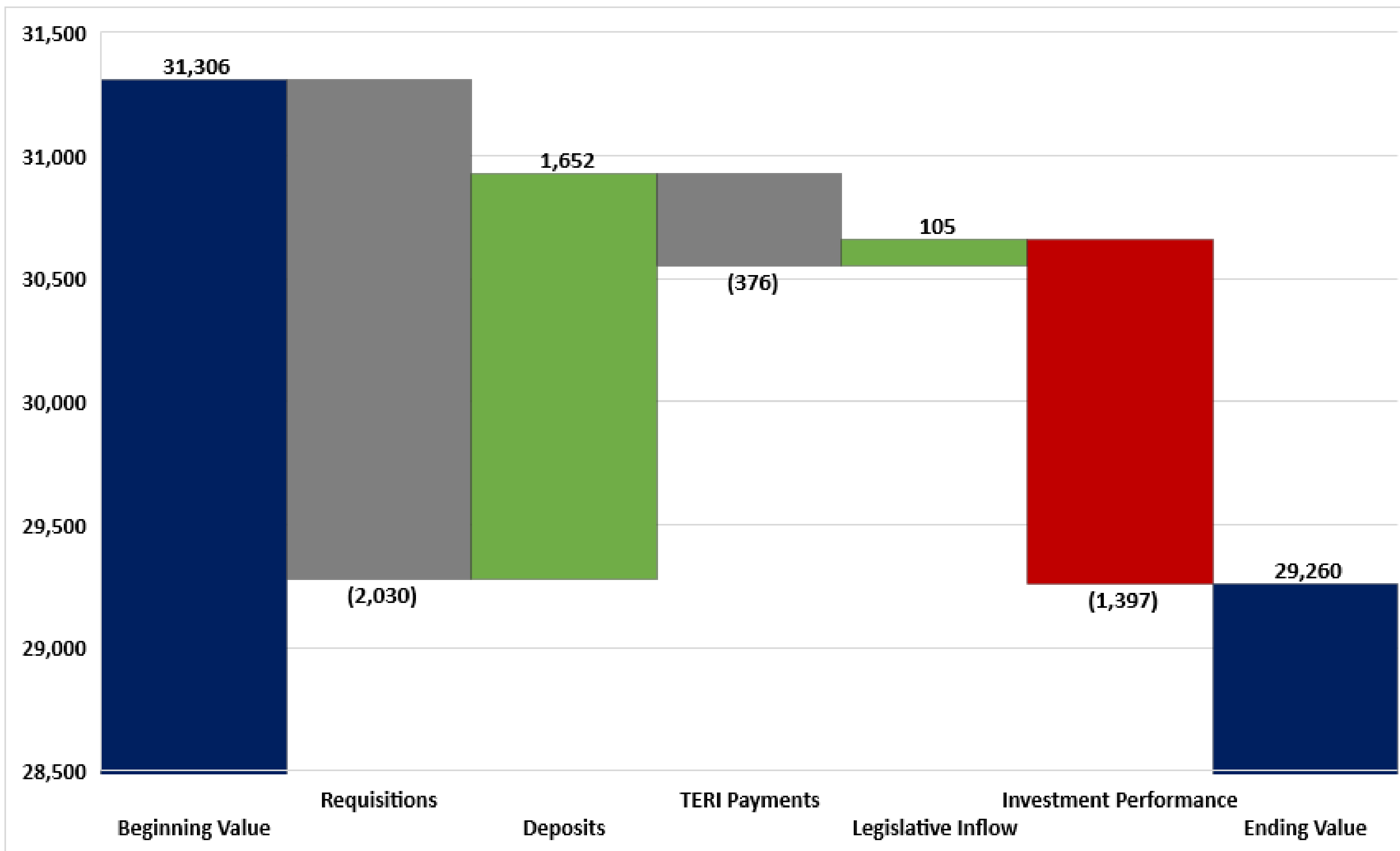
# FYTD Benefits and Performance[2]

FYTD as of December 31, 2018



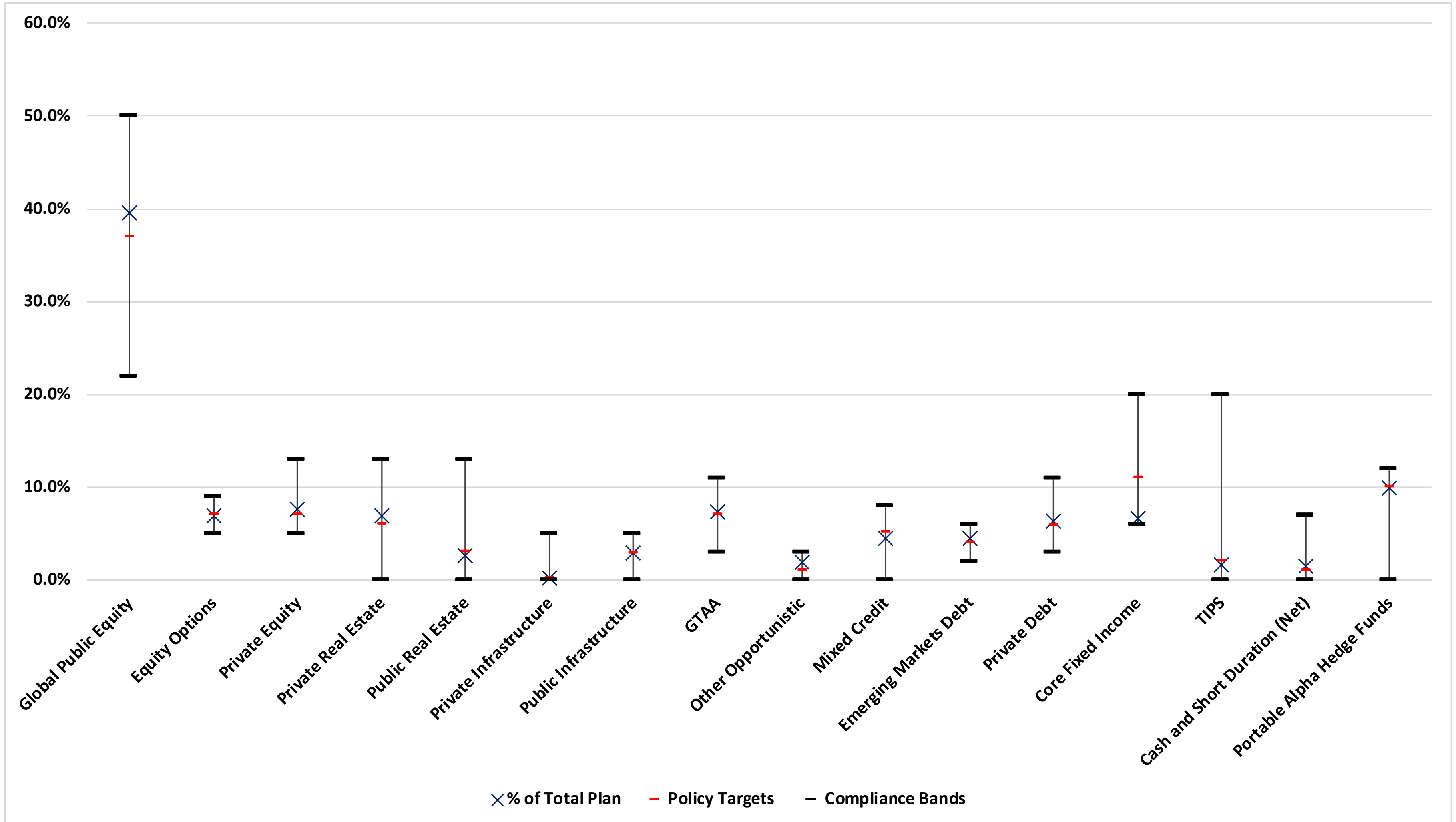
# FYTD Benefits and Performance[2]

FYTD as of December 31, 2018



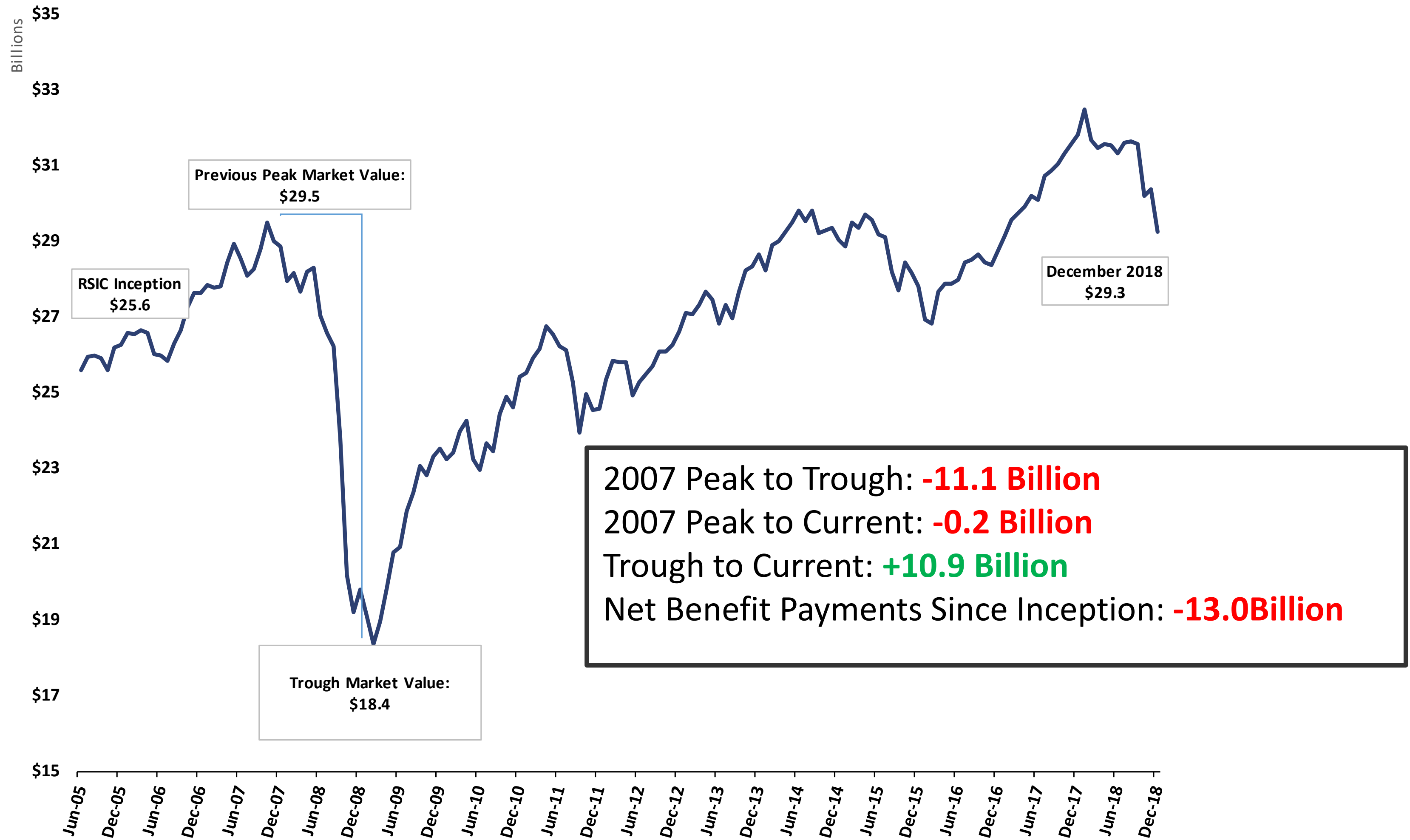
# Portfolio Exposure & Policy Weights [4,8]

As of December 31, 2018



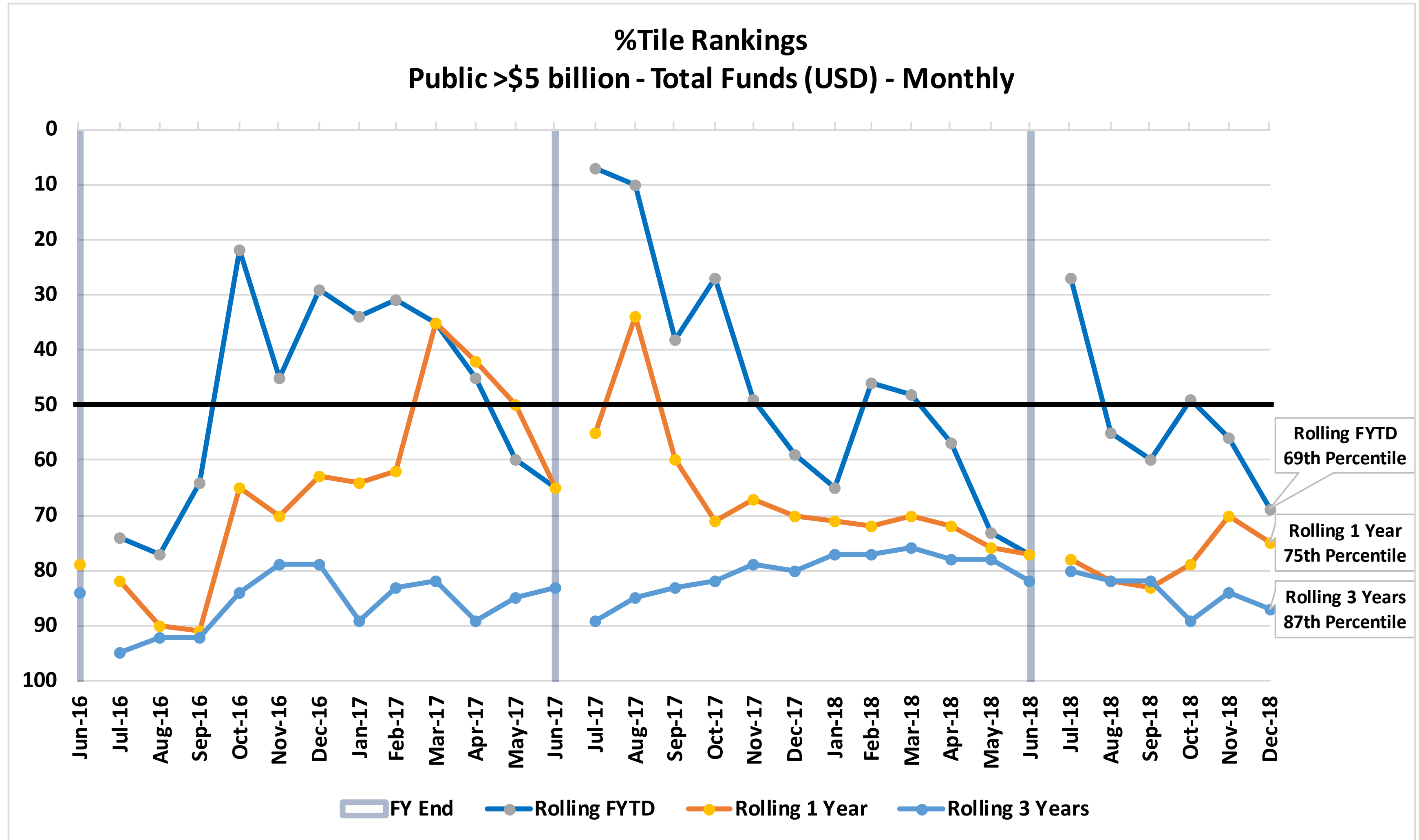
# RSIC Market Value Through Time

As of December 31, 2018



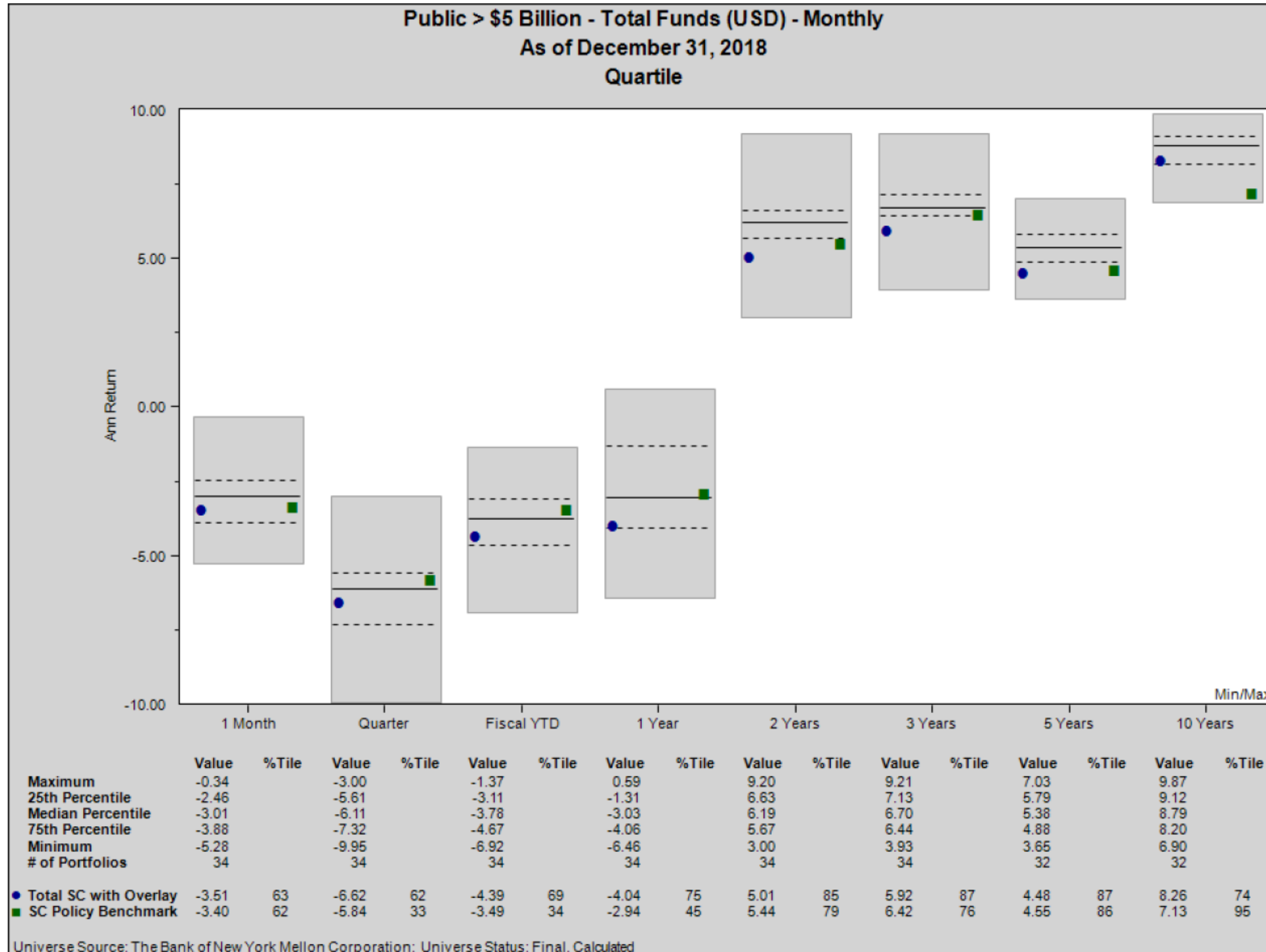
# RSIC Universe Rankings[11]

As of December 31, 2018



# Bank of New York Public Funds > $5 billion[11]

As of December 31, 2018




| | 1 Month Value | 1 Month %Tile | Quarter Value | Quarter %Tile | Fiscal YTD Value | Fiscal YTD %Tile | 1 Year Value | 1 Year %Tile | 2 Years Value | 2 Years %Tile | 3 Years Value | 3 Years %Tile | 5 Years Value | 5 Years %Tile | 10 Years Value | 10 Years %Tile |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum | -0.34 | | -3.00 | | -1.37 | | 0.59 | | 9.20 | | 9.21 | | 7.03 | | 9.87 | |
| 25th Percentile | -2.46 | | -5.61 | | -3.11 | | -1.31 | | 6.63 | | 7.13 | | 5.79 | | 9.12 | |
| Median Percentile | -3.01 | | -6.11 | | -3.78 | | -3.03 | | 6.19 | | 6.70 | | 5.38 | | 8.79 | |
| 75th Percentile | -3.88 | | -7.32 | | -4.67 | | -4.06 | | 5.67 | | 6.44 | | 4.88 | | 8.20 | |
| Minimum | -5.28 | | -9.95 | | -6.92 | | -6.46 | | 3.00 | | 3.93 | | 3.65 | | 6.90 | |
| # of Portfolios | 34 | | 34 | | 34 | | 34 | | 34 | | 34 | | 32 | | 32 | |
| ● Total SC with Overlay | -3.51 | 63 | -6.62 | 62 | -4.39 | 69 | -4.04 | 75 | 5.01 | 85 | 5.92 | 87 | 4.48 | 87 | 8.26 | 74 |
| ■ SC Policy Benchmark | -3.40 | 62 | -5.84 | 33 | -3.49 | 34 | -2.94 | 45 | 5.44 | 79 | 6.42 | 76 | 4.55 | 86 | 7.13 | 95 |

Universe Source: The Bank of New York Mellon Corporation; Universe Status: Final, Calculated

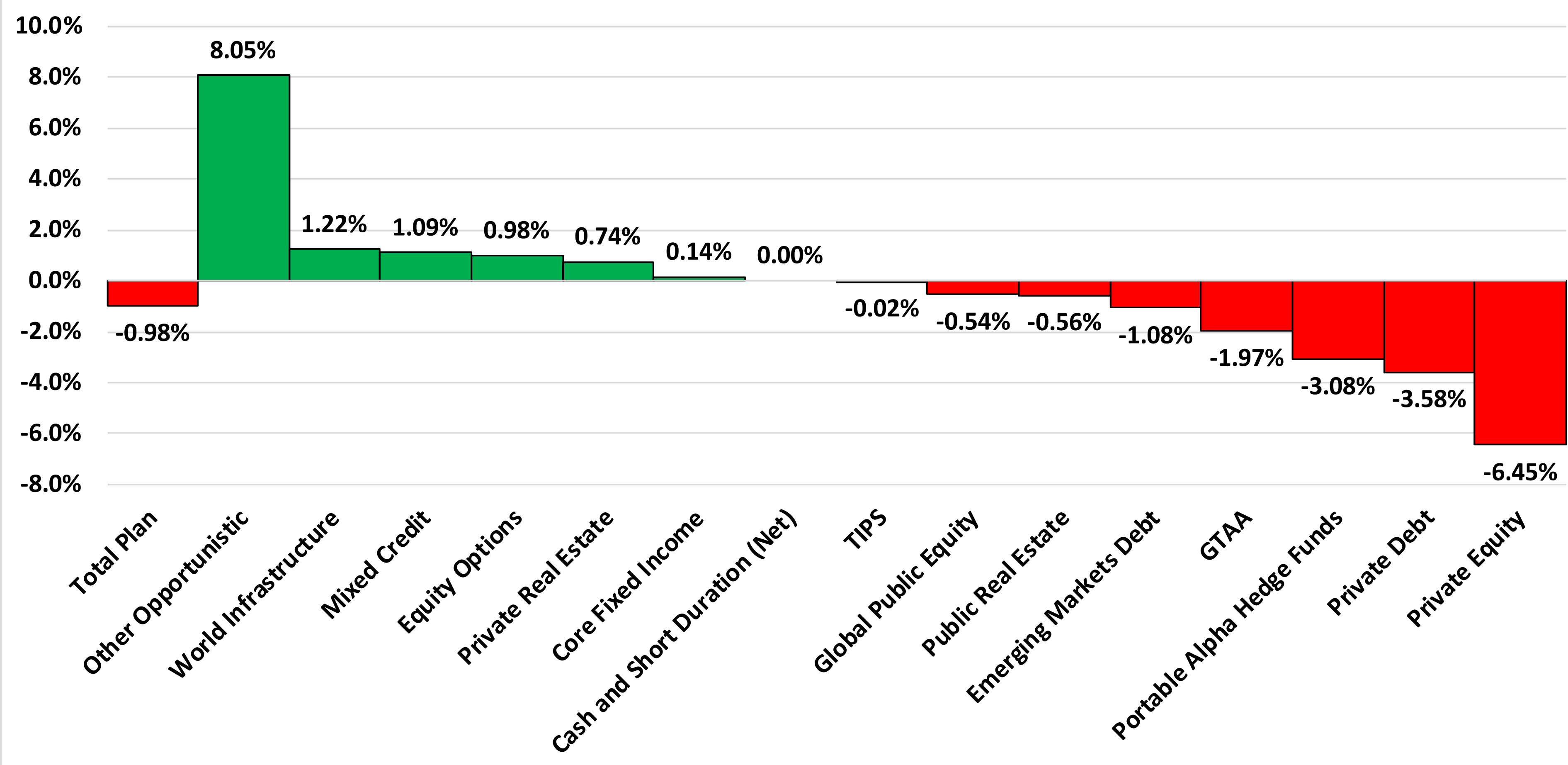
# Performance – Plan & Asset Classes[1,3,4,10]

As of December 31, 2018

| Asset Class / Benchmark returns as of 12/31/18 | Plan Weight | Month | 3 Month | YTD | FYTD | Annualized 1 Year | Annualized 3 Years | Annualized 5 Years |
|---|---|---|---|---|---|---|---|---|
| **Total Plan** | 100.0% | -3.51% | -6.65% | -4.20% | -4.47% | -4.20% | 5.75% | 4.33% |
| ***Policy Benchmark*** | | -3.40% | -5.84% | -2.94% | -3.49% | -2.94% | 6.42% | 4.55% |
| Global Public Equity | 39.4% | -6.94% | -13.33% | -11.27% | -10.26% | -11.27% | 6.07% | 3.78% |
| *Global Public Equity Blend* | | -6.91% | -12.87% | -9.89% | -9.72% | -9.89% | 6.52% | 4.22% |
| Equity Options | 6.9% | -6.23% | -9.82% | -5.72% | -5.91% | -5.72% | n/a | n/a |
| *Blended Equity Options BM* | | -7.65% | -11.04% | -5.23% | -6.89% | -5.23% | n/a | n/a |
| Private Equity | **7.58%** | -0.90% | -0.10% | 11.30% | 4.22% | 11.30% | 11.54% | 11.72% |
| *Private Equity Blend* | | 0.57% | 6.63% | 17.51% | 10.67% | 17.51% | 18.52% | 14.65% |
| GTAA | 7.3% | -5.09% | -9.30% | -9.75% | -7.86% | -9.75% | 2.89% | 1.67% |
| *GTAA Benchmark Blend* | | -4.42% | -8.14% | -6.38% | -5.89% | -6.38% | 4.40% | 2.67% |
| Other Opportunistic | 1.9% | -3.41% | -1.50% | 5.73% | 2.16% | 5.73% | n/a | n/a |
| *GTAA Benchmark Blend* | | -4.42% | -8.14% | -6.38% | -5.89% | -6.38% | n/a | n/a |
| Core Fixed Income | 6.6% | 1.52% | 1.69% | 0.30% | 1.80% | 0.30% | 2.28% | 2.55% |
| *Barclays US Aggregate Bond Index* | | 1.84% | 1.64% | 0.01% | 1.66% | 0.01% | 2.06% | 2.52% |
| TIPS | 1.5% | 0.59% | -0.34% | -1.26% | -1.26% | n/a | n/a | n/a |
| *Barclays US Treasury Inflations Notes* | | 0.55% | -0.42% | -1.26% | -1.24% | n/a | n/a | n/a |
| Cash and Short Duration (Net) | 1.5% | 0.29% | 0.61% | 1.40% | 1.06% | 1.40% | 1.14% | 0.82% |
| *ICE BofA Merrill Lynch 3-Month T-Bill* | | 0.18% | 0.56% | 1.87% | 1.06% | 1.87% | 1.02% | 0.63% |
| Mixed Credit | 4.4% | -1.54% | -2.49% | 0.28% | -0.87% | 0.28% | 5.68% | 2.73% |
| *Mixed Credit Blend* | | -2.34% | -3.99% | -0.82% | -1.96% | -0.82% | 5.63% | 3.78% |
| Private Debt | 6.3% | -0.54% | -0.63% | 2.93% | -0.26% | 2.93% | 6.40% | 5.41% |
| *S&P/LSTA Leveraged Loan + 150 Bps on a 3-month lag* | | 0.79% | 2.18% | 6.69% | 3.32% | 6.69% | 6.82% | 5.63% |
| Emerging Markets Debt | 4.4% | 1.28% | 0.14% | -6.66% | -0.40% | -6.66% | 5.93% | 2.41% |
| *Emerging Markets Debt Blend* | | 1.33% | 0.42% | -5.16% | 0.67% | -5.16% | 5.61% | 1.95% |
| Private Real Estate | 6.8% | 0.50% | 2.24% | 9.84% | 4.57% | 9.84% | 10.22% | 13.09% |
| *Private Real Estate Custom Benchmark* | | 1.50% | 1.67% | 8.65% | 3.83% | 8.65% | 9.29% | 11.31% |
| Public Real Estate | 2.6% | -7.98% | -7.15% | -5.17% | -6.14% | -5.17% | n/a | n/a |
| *FTSE NAREIT Equity REITs Index* | | -8.23% | -6.73% | -4.62% | -5.58% | -4.62% | n/a | n/a |
| World Infrastructure | 3.0% | -4.49% | -5.26% | -7.17% | -5.44% | -7.17% | n/a | n/a |
| *Dow Jones Brookfield Global Infrastructure Net Index* | | -4.83% | -5.88% | -7.87% | -6.66% | -7.87% | n/a | n/a |
| Portable Alpha Hedge Funds | 10.0% | *1.92%* | *-0.66%* | *0.34%* | *-0.76%* | *0.34%* | *1.85%* | *4.78%* |
| *Portable Alpha HF Blend* | | *0.39%* | *1.18%* | *2.32%* | *2.32%* | *2.32%* | *1.17%* | *1.06%* |
| **Portable Alpha Collateral** | 18.9% | 0.19% | -0.07% | -0.08% | -0.16% | -0.08% | n/a | n/a |
| Portable Alpha Benchmark | | 0.13% | 0.50% | 1.17% | 1.17% | 1.17% | n/a | n/a |

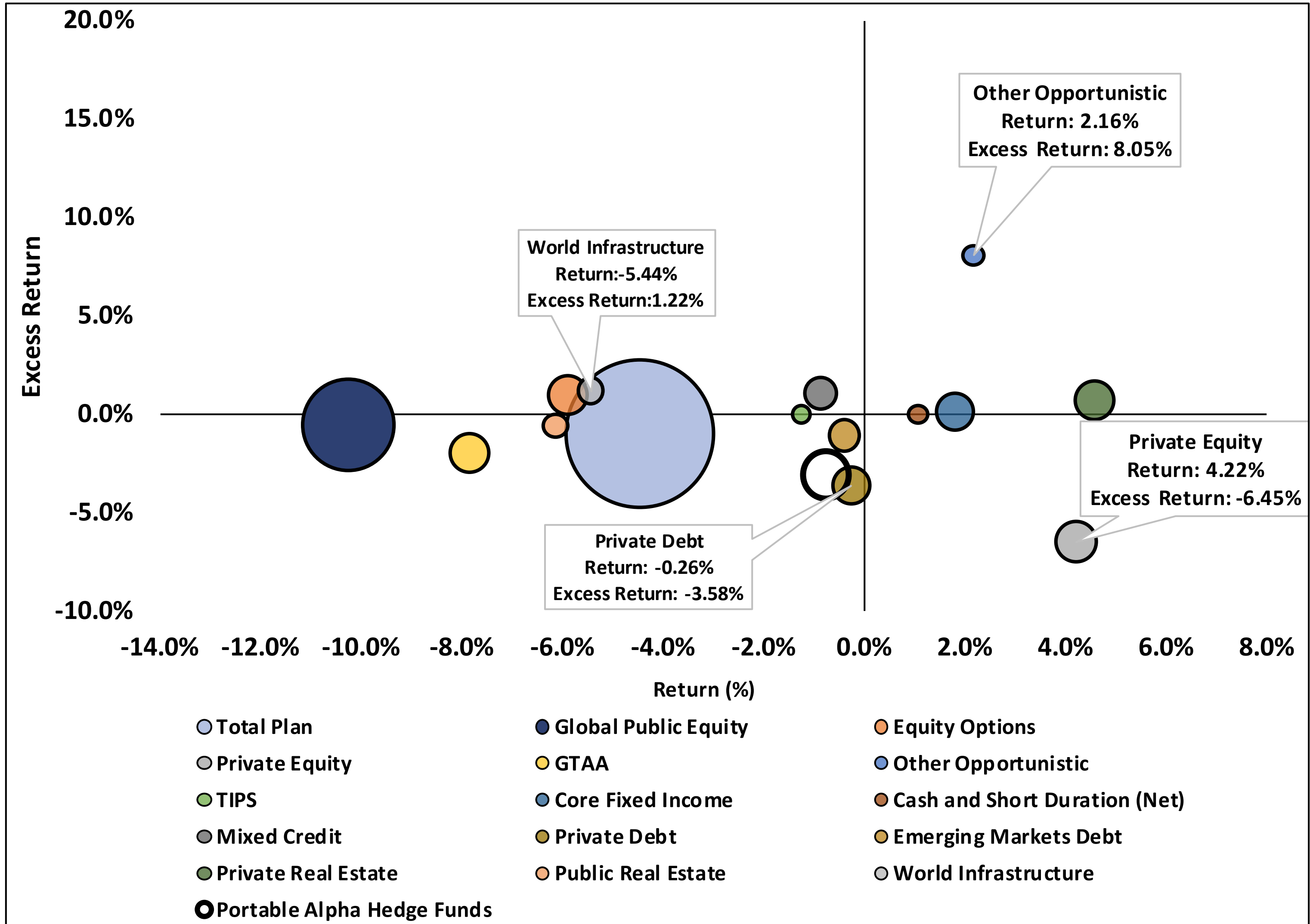
# Relative Performance to Policy Benchmarks[3,4,10]

FYTD as of December 31, 2018



# Asset Class Return & Excess[3,4,5]

FYTD as of December 31, 2018



# Attribution of Plan Excess Returns to Policy Benchmark

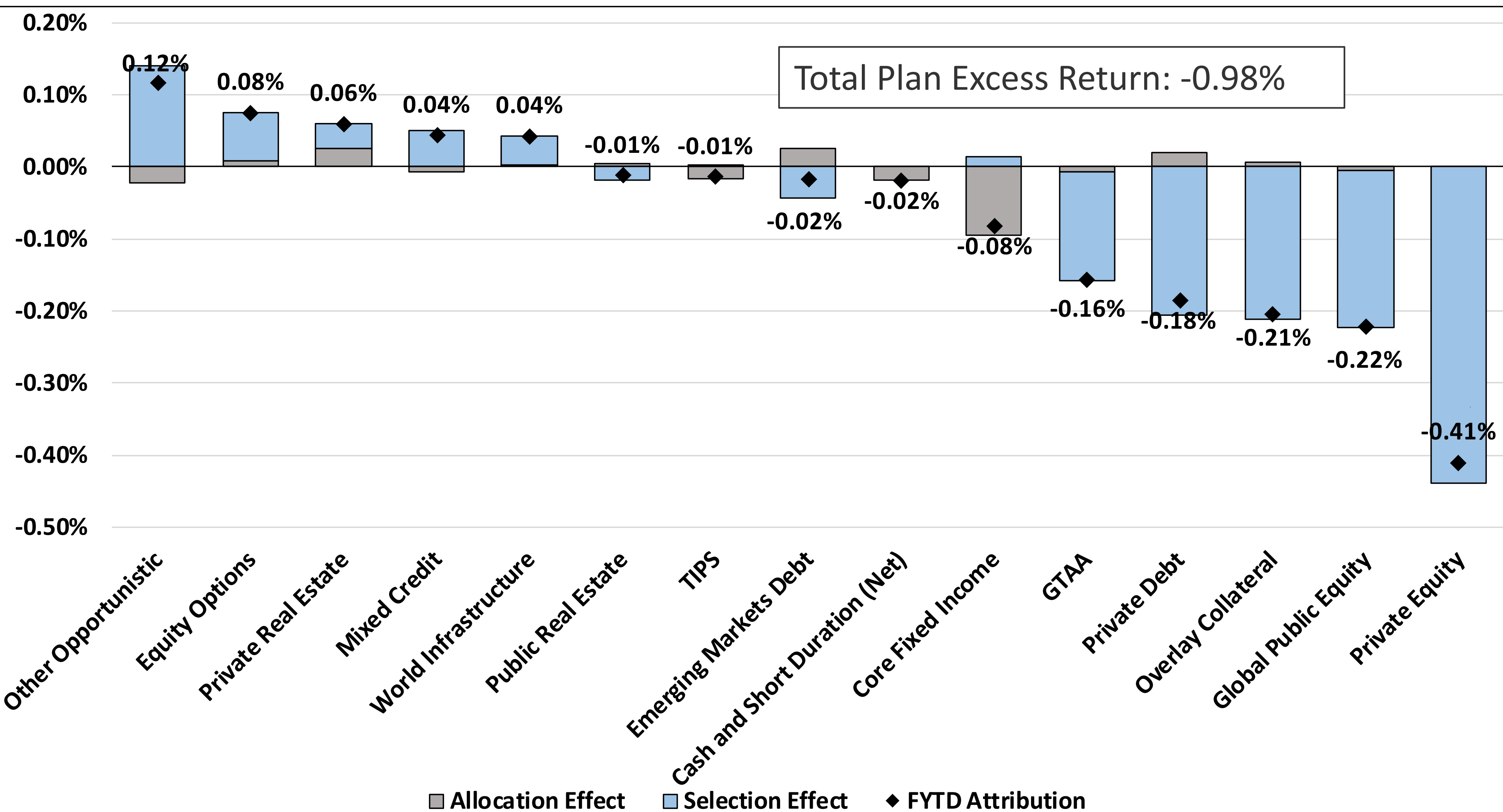
FYTD as of December 31, 2018

| Fiscal Year Attribution | Total Attribution | Allocation Effect | Selection Effect | Average O/U Weight | Asset Class FY Return | Asset Class BM Return |
|---|---|---|---|---|---|---|
| **Other Opportunistic** | 0.12% | -0.02% | 0.14% | 0.80% | 2.16% | -5.89% |
| **Equity Options** | 0.08% | 0.01% | 0.07% | 0.02% | -5.91% | -6.89% |
| **Private Real Estate** | 0.06% | 0.02% | 0.03% | 0.13% | 4.57% | 3.83% |
| **Mixed Credit** | 0.04% | -0.01% | 0.05% | -0.34% | -0.87% | -1.96% |
| **World Infrastructure** | 0.04% | 0.00% | 0.04% | -0.02% | -5.44% | -6.66% |
| **Public Real Estate** | -0.01% | 0.01% | -0.02% | 0.06% | -6.14% | -5.58% |
| **TIPS** | -0.01% | -0.02% | 0.00% | -0.15% | -1.26% | -1.24% |
| **Emerging Markets Debt** | -0.02% | 0.03% | -0.04% | 0.13% | -0.40% | 0.67% |
| **Cash and Short Duration (Net)** | -0.02% | -0.02% | 0.00% | -0.46% | 1.06% | 1.06% |
| **Core Fixed Income** | -0.08% | -0.10% | 0.01% | -0.88% | 1.80% | 1.66% |
| **GTAA** | -0.16% | -0.01% | -0.15% | 0.35% | -7.86% | -5.89% |
| **Private Debt** | -0.18% | 0.02% | -0.20% | 0.06% | -0.26% | 3.32% |
| **Global Public Equity** | -0.22% | -0.01% | -0.22% | 0.24% | -10.26% | -9.73% |
| **Private Equity** | -0.41% | 0.03% | -0.44% | 0.05% | 4.22% | 10.67% |
| **Overlay Collateral** | -0.21% | 0.01% | -0.21% | 0.12% | -0.16% | 1.17% |
| **Portable Alpha Hedge Funds** | -0.20% | 0.01% | -0.20% | 0.12% | -0.76% | 1.24% |
| **Ported Short Duration** | 0.00% | 0.00% | 0.00% | n/a | -0.06% | n/a |
| **Ported Cash** | -0.01% | 0.00% | -0.01% | n/a | -0.11% | n/a |

| | **Total Plan Excess Return** | **Allocation Effect** | **Selection Effect** | **Interaction / Other** | **RSIC Return** | **RSIC Policy Benchmark Return** |
|---|---|---|---|---|---|---|
| **FYTD Total** | -0.98% | -0.05% | -0.94% | 0.01% | -4.47% | -3.49% |

# Attribution of Plan Excess Returns to Policy Benchmark

FYTD as of December 31, 2018



# APPENDIX

# SIOP Compliance

| Asset Allocation | Market Value as of 12/31/18 | Overlay Exposures | Net Position | % of Total Plan | Policy Targets | Difference | Allowable Ranges | SIOP Compliance |
|---|---|---|---|---|---|---|---|---|
| **Equities** | **11,871** | | **15,763** | **53.9%** | **51.0%** | **2.9%** | **31% - 59%** | YES |
| Global Public Equity | 7,981 | 3,557 | 11,538 | 39.4% | 37.0% | 2.4% | 22% - 50% | YES |
| Equity Options | 1,673 | 335 | 2,008 | 6.9% | 7.0% | -0.1% | 5% - 9% | YES |
| Private Equity | 2,217 | 0 | 2,217 | 7.6% | 7.0% | 0.6% | 5% - 13% | YES |
| **Real Assets** | **3,621** | | **3,621** | **12.4%** | **12.0%** | **0.4%** | **7% - 17%** | YES |
| Private Real Estate | 1,991 | | 1,991 | 6.8% | 5.9% | 0.9% | 0% - 13% | YES |
| Public Real Estate | 754 | | 754 | 2.6% | 3.1% | -0.5% | 0% - 13% | YES |
| Private Infrastructure | 56 | | 56 | 0.2% | 0.2% | 0.0% | 0% - 5% | YES |
| Public Infrastructure | 819 | | 819 | 2.8% | 2.8% | 0.0% | 0% - 5% | YES |
| **Opportunistic** | **2,669** | | **2,669** | **9.1%** | **8.0%** | **1.1%** | | |
| GTAA | 2,122 | 0 | 2,122 | 7.3% | 7.0% | 0.3% | 3% - 11% | YES |
| Other Opportunistic | 547 | 0 | 547 | 1.9% | 1.0% | 0.9% | 0% - 3% | YES |
| **Credit** | **4,408** | | **4,408** | **15.1%** | **15.0%** | **0.1%** | **10% - 20%** | YES |
| Mixed Credit | 1,277 | | 1,277 | 4.4% | 5.2% | -0.8% | 0% - 8% | YES |
| Emerging Markets Debt | 1,280 | | 1,280 | 4.4% | 4.0% | 0.4% | 2% - 6% | YES |
| Private Debt | 1,851 | | 1,851 | 6.3% | 5.8% | 0.5% | 3% - 11% | YES |
| **Rate Sensitive** | **3,817** | | **2,799** | **9.6%** | **14.0%** | **-4.4%** | **4% - 24%** | YES |
| Core Fixed Income | 727 | 1,196 | 1,923 | 6.6% | 11.0% | -4.4% | 6% - 20% | YES |
| TIPS | 0 | 445 | 445 | 1.5% | 2.0% | -0.5% | 0% - 20% | YES |
| Cash and Short Duration (Net) | 3,090 | -2,660 | 431 | 1.5% | 1.0% | 0.5% | 0% - 7% | YES |
| Portable Alpha Hedge Funds | 2,874 | -2,874 | 0 | 9.8%* | 10.0% | -0.2% | 0% - 12% | YES |
| **Total Plan** | **$29,260** | - | **$29,260** | **100.0%** | **110.0%** | | | |
| **Total Hedge Funds** | 3,085 | | **$3,085** | **10.5%** | n/a | n/a | 0% - 20% | YES |
| **Total Private Markets** | 6,116 | - | **$6,116** | **20.9%** | n/a | n/a | 14% - 25% | YES |

**Total Hedge Fund exposure: 10.5% and consisted of: 9.8% Portable Alpha Hedge Funds, 0.7% to a hedge fund in Mixed Credit *Portable Alpha Hedge Funds are expressed and benchmarked as gross exposure but employed in conjunction with the Overlay Program and are offset when looking at total plan market value.**

# Footnotes & Disclosures

**Footnotes**

1. Represents asset class benchmarks as of reporting date. Benchmarks for asset classes may have changed over time.
2. Benefit payments are the net of Plan contributions and disbursements.
3. "Cash" market value is the aggregate cash held at the custodian, Russell Investments, and strategic partnerships.
4. Asset class exposures and returns include blended physical and synthetic returns and current notional values (EM Debt, GTAA, Global Public Equity, Real Estate, Core Fixed Income, Private Equity, and Commodities). Synthetic returns are provided by Russell Investments gross of financing costs. To accommodate for financing costs, LIBOR is added to the synthetic returns and removed from the collateral return.
5. Performance contribution methodology: Contribution is calculated by taking the sum of the [beginning weight] X [monthly return].
6. Source: Russell Investments; Net notional exposure.
7. Allocation Effect: [Asset Class Weight – Policy Weight] * [Benchmark Return – Plan Policy Benchmark]
   Selection Effect: [Asset Class Return – Policy Benchmark Return] * Asset Class Weight in Plan
8. The target weights to Private Equity, Private Debt, and Private Real Estate will be equal to their actual weights, reported by the custodial bank, as of the prior month end. When flows have occurred in the asset classes, flow adjusted weights are used to more accurately reflect the impact of the asset class weights. In the case of Private Equity, the use of the flow adjusted weight will affect the target allocation to Public Equity, such that the combined target weight of both asset classes shall equal 44% of the Plan. For Private Debt, the use of the flow adjusted weight will affect the target allocation to Mixed Credit, such that the combined target weight of both asset classes shall equal 11% of the Plan. For Private Real Estate, the use of the flow adjusted weight will affect the target allocation to Public Real Estate, such that the combined target weight of both asset classes shall equal 9% of the Plan.
9. Policy Ending Value is an estimate of the Plan NAV had it earned the Policy Benchmark return.
10. Collateral held to support the overlay program represents opportunity cost associated with financing the overlay program. The Overlay collateral consists of Ported Cash, Ported Short Duration, and Portable Alpha Hedge Funds. The cost of holding these assets is proxied using 3 Month LIBOR. This benchmark is not a component of the Policy benchmark.
11. RSIC Peer Universe is Bank of New York Public Plans Greater than $5 Billion. The universe includes fund returns that are gross of invoiced fees. The RSIC percentile rank represents the RSIC return gross of invoiced fees.

**Disclosures**

- Returns are provided by BNY Mellon and are time-weighted, total return calculations. Net of fee performance is calculated and presented after the deduction of fees and expenses. Periods greater than one year are annualized. Past performance is no guarantee of future results. Policy benchmark is the blend of asset class policy benchmarks using policy weights. Asset class benchmarks and policy weights are reviewed annually by the Commission's consultant and adopted by the Commission and have changed over time. The policy benchmark return history represents a blend of these past policies.
- Overlay allocation detail is provided by Russell Investments.
- This report was compiled by the staff of the South Carolina Retirement System Investment Commission and has not been reviewed, approved or verified by the external investment managers. No information contained herein should be used to calculate returns or compare multiple funds, including private equity funds.
- Effective October 1, 2005, the State Retirement System Preservation and Investment Reform Act ("Act 153") established the Commission and devolved fiduciary responsibility for investment and management of the assets of the South Carolina Retirement Systems upon RSIC.
- Allocation / exposure percentages might not add up to totals due to rounding.

# Footnotes & Disclosures

**Benchmarks**

- **Global Public Equity Blend**:
  - *7/2018 – Present*: Weighted average of regional sub-asset class targets in Policy Portfolio. 51.4% MSCI US IMI Index for U.S. Equity, 31.4% MSCI World ex-US IMI Index for Developed Market Equity (non-U.S.), and 17.1% MSCI Emerging Markets IMI Index for Emerging Market Equity
  - *7/2016 – 6/2018:* MSCI All-Country World Investable Markets Index (net of dividends)
  - *Prior to 7/2016:* MSCI All-Country World Index (net of dividends)
- **Equity Options Strategies:**
  - *7/2018 – Present:* 50% CBOE S&P Buy Write Index (BXM) / 50% CBOE S&P 500 Put Write Index (PUT)
  - *Prior to 6/2018:* CBOE S&P 500 Buy Write Index (BXM)
- **Private Equity Blend**: 80% Russell 3000 Index on a 3-month lag / 20% MSCI EAFE (net of dividends) on a 3-month lag Plus 300 basis points
- **Core Fixed Income**: Bloomberg Barclays US Aggregate Bond Index
- **Emerging Market Debt**: 50% JP Morgan EMBI Global Diversified (US Dollar) / 50% JP Morgan GBIEM Global Diversified (Local)
- **Private Debt** : S&P/LSTA Leveraged Loan Index + 150 basis points on a 3-month lag
- **Mixed Credit Blend**:
  - *7/2016 – Present:* 1/2 Bloomberg Barclays US Corporate High Yield 2% Issuer Capped Bond Index; 1/2 S&P/LSTA Leveraged Loan Index
  - *Prior to 6/2016:* 1/3 Bloomberg Barclays US Corporate High Yield 2% Issuer Capped Bond Index; 1/3 S&P/LSTA Leveraged Loan Index; 1/3 Bloomberg Barclays US Mortgage Backed Securities (MBS) Index
- **GTAA Blend**:
  - *7/2018 – Present:* Total System Policy Benchmark ex-Private Markets and Portable Alpha
  - *7/2016 – 6/2018:* 50% MSCI World Index (net of dividends); 50% Bloomberg Barclays US Aggregate Bond Index
  - *Prior to 7/2016*: 50% MSCI World Index (net of dividends); 50% FTSE World Government Bond Index (WGBI)
- **Other Opportunistic**:
  - *7/2018 – Present:* Total System Policy Benchmark ex-Private Markets and Portable Alpha
  - *7/2016 – 6/2018:* 50% MSCI World Index (net of dividends); 50% Bloomberg Barclays US Aggregate Bond Index
- **Private Real Estate Blend:**
  - *7/2018 – Present:* NCREIF Open-End Diversified Core (ODCE) Index *Net of Fees* + 100 basis points
  - *Prior to 6/2018:* NCREIF Open-end Diversified Core (ODCE) Index *Gross of Fees* + 75 basis points
- **Public Real Estate:** FTSE NAREIT Equity REITs Index
- **Infrastructure:** Dow Jones Brookfield Global Infrastructure Index
- **Cash & Short Duration**: ICE BofA Merrill Lynch 3-Month US Treasury Bill Index
- **Portable Alpha Hedge Fund Blend**:
  - *7/2018 – Present:* ICE BofA Merrill Lynch 3-Month T-Bills + 250 basis points
  - *7/2016-6/2018:* *Prior to FY 2019, there was not a benchmark for Portable Alpha Hedge Funds, so effectively zero*
  - Prior to 7/2016: HFRI Fund Weighted Composite Index (NOTE: PA HFs were considered Low Beta Hedge Funds at this time).
- **Portable Alpha Benchmark**:
  - *7/2018 – Present:* *Weighted average of monthly weights for PA Hedge Funds* ICE BofA Merrill Lynch 3-Month T-Bills + 250 basis points, and Zero for Ported Cash and Short Duration
  - *7/2016-6/2018:* *Prior to FY 2019, there was not a benchmark for Portable Alpha Hedge Funds, so effectively zero*

RSIC RETIREMENT SYSTEM INVESTMENT COMMISSION

# Annual Investment Plan Progress Report Fiscal Year 2019 Mid-Year Update

Geoff Berg, CIO

# Summary Update

- AIP included 34 different goals/initiatives
  - 28 from the investment team
    - 16 of these are "single-year" initiatives
    - 12 are multi-year, or "ongoing" initiatives
  - Non-investment team initiatives relate to Reporting, IT, and Legal initiatives
  - *Considerable* progress toward initiatives

# Current-Year Initiatives

- Nearly 75% of current-year initiatives are completed or nearing completion.

| INITIATIVE | SINGLE OR MULTI-YR | STATUS |
|---|---|---|
| **A. INVESTMENT TEAM - CURRENT YEAR INITIATIVES** | | |
| **Implement Policy Asset Allocation** | Single | COMPLETED |
| **TIPS: create implementation plan for exposure** | Single | COMPLETED |
| **EM small cap manager search** | Single | COMPLETED |
| **Passive Index Menu** | Single | COMPLETED |
| **Evaluate insurance-linked strategies** | Single | COMPLETED |
| **Evaluate impact of rising rates on Securities Lending** | Single | COMPLETED |
| **Work with Securities Lending agent to improve reporting** | Single | COMPLETED |
| **Co-investment platform - design & implementation** | Single | NEARING COMPLETION |
| **Active/Enhanced/Passive Framework** | Single | NEARING COMPLETION |
| **Use of Equity Options in international markets** | Single | NEARING COMPLETION |
| **Currency hedging - evaluate options (w/Meketa)** | Single | NEARING COMPLETION |
| **Develop strategy to exploit credit market turbulence** | Single | NEARING COMPLETION |
| **Re-underwrite existing active equity strategies** | Single | ONGOING |
| **Rebalancing options (cost/benefit analysis)** | Single | VERY EARLY |
| **Evaluate additional alt beta strategies** | Single | VERY EARLY |
| **PD and Credit: Develop way to track key differentials** | Single | VERY EARLY |

# Multi-Year and Ongoing Initiatives

- We have made progress on 8 of 12 ongoing initiatives.

| INITIATIVE | SINGLE OR MULTI-YR | STATUS |
|---|---|---|
| **B. INVESTMENT TEAM - MULTI-YEAR INITIATIVES** | | |
| **Challenging beliefs (continue)** | Multi | ONGOING |
| **Mixed Credit: monitor secured vs. unsecured mix** | Multi | ONGOING |
| **Build-out of Investment Risk function** | Multi | ONGOING |
| **Fee and expense review - structural vs. variable** | Multi | ONGOING |
| **Manager debates (GAA)** | Multi | ONGOING |
| **Enhance Private Markets quantitative underwriting** | Multi | ONGOING |
| **Infrastructure: build out private portfolio** | Multi | ONGOING |
| **Non-PA HFs: complete wind-down** | Multi | ONGOING |
| **Create opportunities for investment team to work across asset classes** | Multi | ONGOING |
| **Asset consolidation w/high conviction mgrs; improve cost** | Multi | ONGOING |
| **TAA and Rebalancing - strengthen capabilities** | Multi | ONGOING |
| **Review of investment process** | Multi | VERY EARLY |

# Non-Investment Initiatives

- Progress being made in non-investment initiatives, most of which are multi-year.

| INITIATIVE | SINGLE OR MULTI-YR | STATUS |
|---|---|---|
| C. NON-INVESTMENT TEAM AIP INITIATIVES | | |
| **Ops - Explore improvements to FI portfolio accounting** | Single | COMPLETED |
| **Ops - Assess performance reporting ecosystem needs** | Multi | NEARING COMPLETION |
| **Ops - Enhance IT infrastructure to support RSIC business needs** | Multi | ONGOING |
| **Ops - Research, implement CMS solution** | Multi | ONGOING |
| **Legal - Evaluate contracting/closing process** | Multi | ONGOING |
| **Legal - Assess different ownership structures** | Multi | ONGOING |

# Blackstone Real Estate Partners IX
# "BREP IX"

Eric Rovelli, CFA

Chris Alexander, CAIA

Chris Radic, CFA

# BREP IX Investment Strategy



- $100M commitment to Blackstone's global real estate opportunistic fund
- Strategy: Target large, complicated situations where competition is limited and the ability to move quickly is a competitive advantage
- Geographical Focus: ~70% U.S. / ~30% Outside U.S.
- Investment Focus: Large-scale platforms with some single-asset acquisitions
- Philosophy: "*Buy it, fix it, sell it*" mentality
- Global Platform: Utilize breadth of real estate platform to source and underwrite deals. 473 dedicated real estate professionals across 13 offices worldwide
- Value Investor: Look to acquire on a value basis and utilize operational expertise to drive cash flows

# BREP IX Overview

## Prior Blackstone Fund Investments

- Committed $135M to BREP VII, a 2011 vintage fund
- Also we are investors in Blackstone's open-end core-plus fund

## Firm

- Since 1991, Blackstone has invested $77B of capital in real estate through their BREP fund series across over 87,000 assets
- Large global platform with around $119B in AUM and 473 dedicated real estate professionals
- Invests across sectors including: office, retail, multifamily, industrial, hospitality and alternatives (self-storage, senior housing, single family residential)
- Invests across the risk spectrum from core real estate to real estate new development, and in both debt and equity

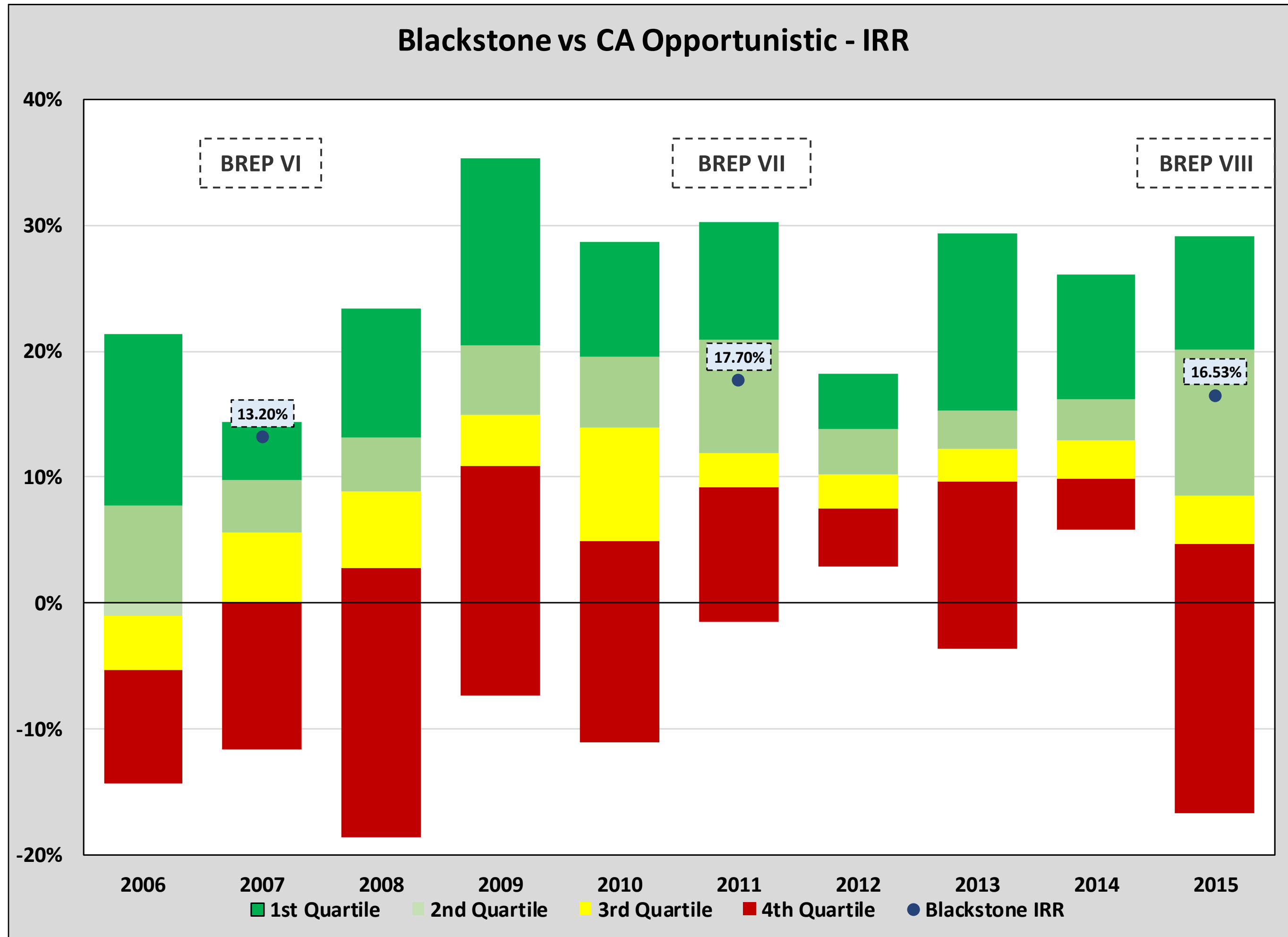
## Performance

- Fund VII has achieved strong performance to date of 17.7% net IRR and 1.66x TVPI

## Concerns/Risks

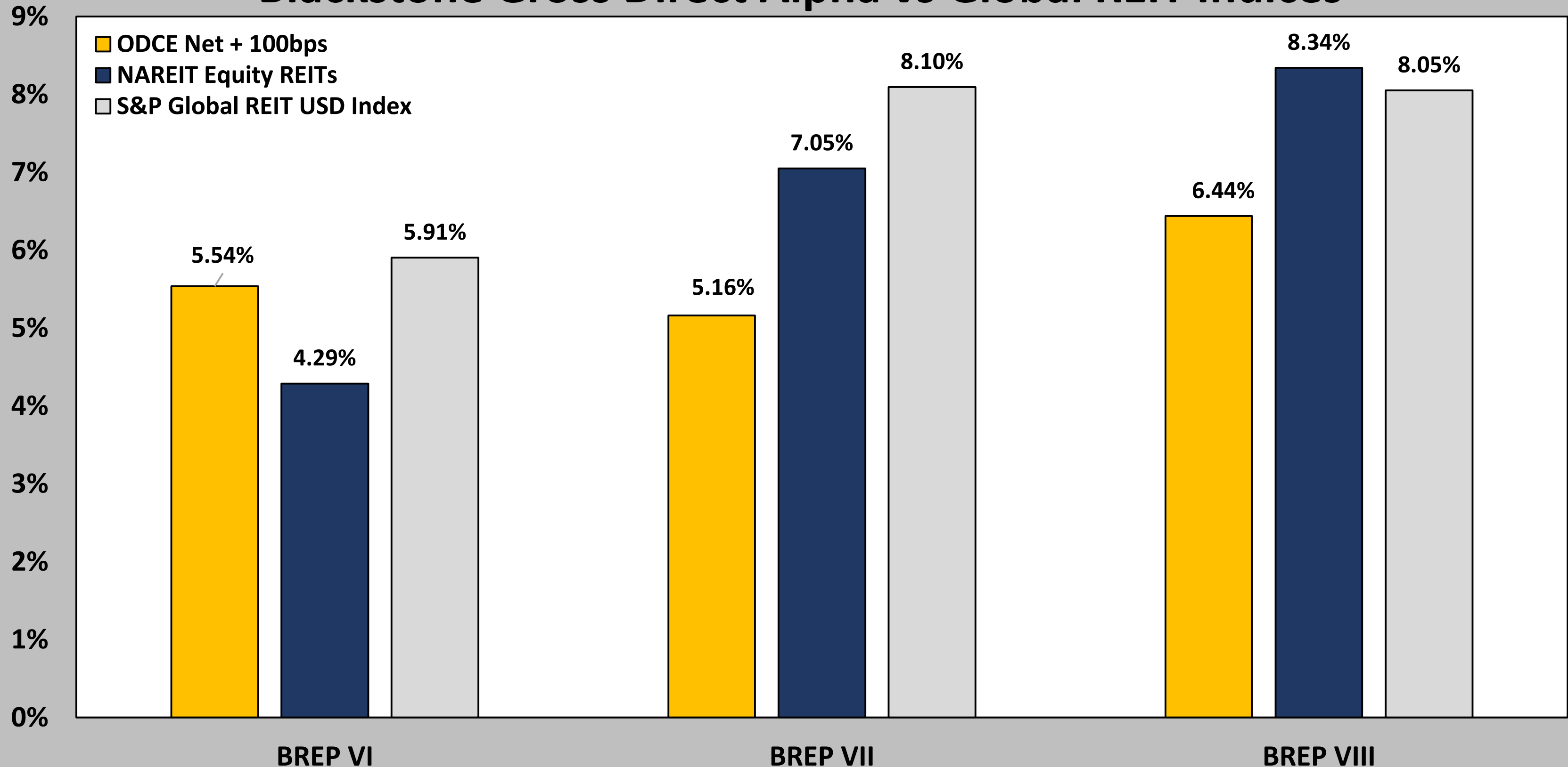
- Performance of Fund V and Fund VI
- Large unrealized portfolio of legacy assets

# Cambridge Quartile Analysis – Net IRR




- Three most recent funds fall in the 1st or 2nd quartile, including the 2007 vintage fund
- BREP VIII is just three years into its fund life

# PME Analysis




| Fund | ODCE Net + 100bps Absolute Return / Fund Direct Alpha | NAREIT Equity REITs Absolute Return / Fund Direct Alpha | S&P Global REIT Absolute Return / Fund Direct Alpha |
|---|---|---|---|
| **BREP VI** | 7.64% / 5.54% | 8.89% / 4.29% | 7.27% / 5.91% |
| **BREP VII** | 12.49% / 5.16% | 10.60% / 7.05% | 9.56% / 8.10% |
| **BREP VIII** | 10.09% / 6.44% | 8.18% / 8.34% | 8.47% / 8.05% |

# Investment Summary

- **$100M commitment to Blackstone Real Estate Partners IX ("BREP IX")**
- **Fund Size**
  - $15B target
  - Blackstone commitment at least $300M
- **Target Returns**
  - 20% gross IRR (15% net) and 2.0x gross multiple (1.7x net)
- **Management Fee**
  - 1.5% on committed and 1.5% on invested thereafter
  - Four month fee holiday for investors in the first close
- **5-Year Investment Period with 10-year Fund Term**
- **Performance Fee**
  - 8% Preferred Return
  - 20% Carried Interest
  - 80/20 GP catchup
  - Modified American
- **Other Fees**
  - 30bps Acquisition fee on gross value

# Brookfield Super-Core Infrastructure Partners

Ashli Aslin

# Brookfield Super-Core Infrastructure Partners Investment Summary

| Investment Summary | |
|---|---|
| **Targeted Net Return** | 8% net return to investors |
| **Estimated Cash Income** | 5-6% cash income |
| **Assets** | Mature, high-quality, stable infra assets with high cash flow |
| **Sectors** | Utilities, energy, power, and transportation sectors |
| **Geography** | OECD, primarily North America, Europe, and Australia |
| **Investment Size** | $200-800 million of equity |

# Brookfield Super-Core Infrastructure Partners Overview

**Existing Relationship for RSIC**

- RSIC currently invested in Brookfield Private Equity and Real Estate funds
- Allocation moves the Infrastructure Portfolio towards the Asset Class Baseline by providing access to core assets, which will achieve the return profile we desire from this asset class.

**Firm**

- Brookfield was founded as Brascan 1899 as a builder and operator of electricity & transport infrastructure in Brazil; Rebranded to Brookfield in 2005.
- Brookfield Asset Management is a publicly-traded investment management firm focusing on real estate, infrastructure, and private equity.

**Investment Thesis**

- Portfolio Benefits of Core Infrastructure
- Large, experienced team
- Robust investment platform
- Brookfield market reputation

**Concerns/Risk**

- Regulatory/Contractual counterparty risk
- New fund without an operating history
- Limited liquidity options

# Brookfield Super-Core Infrastructure Partners Focus

Brookfield is seeking to acquire essential services that support economic activity with high barriers to entry and low demand elasticity.

## The Fund will focus on the following sectors:

### Utilities

Electricity T&D

Water & Wastewater

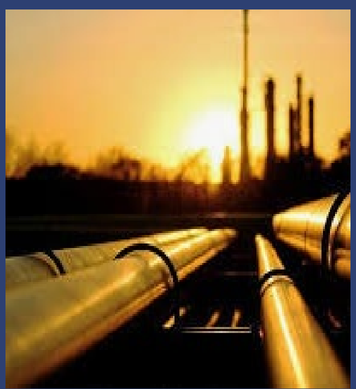
Communication Networks

50-60%

### Energy

Midstream Networks

(Contracted & Regulated)

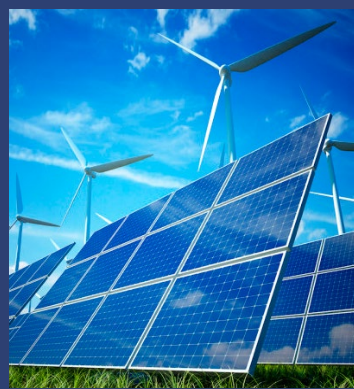


15-20%

### Power

Contracted Generation

(Renewable & Conventional)



15-20%

### Transportation

Transportation Networks

(Availability-Based & Regulated)

10%

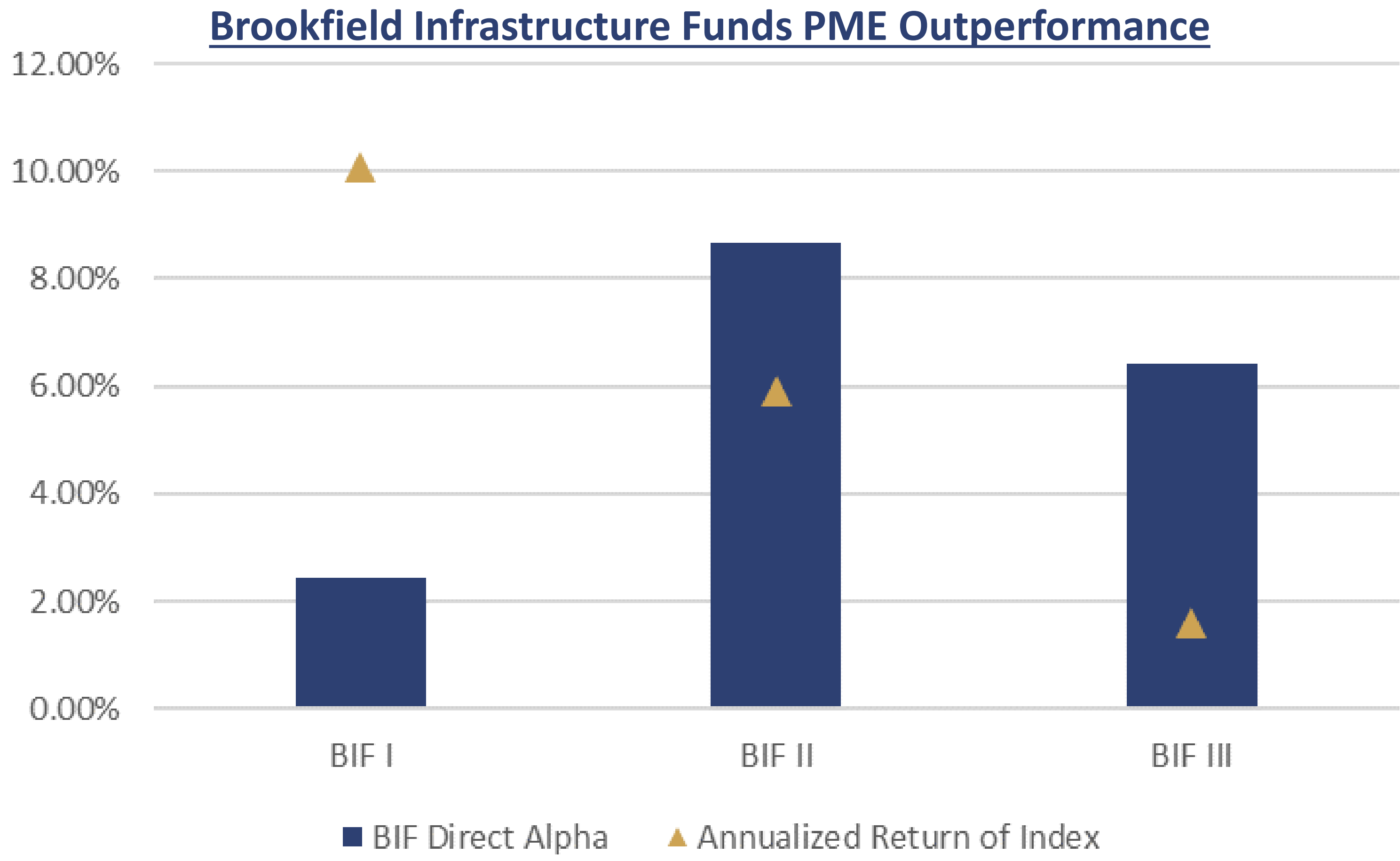
### Other

Public Private Partnerships (PPPs)

(With Risk Mitigation Characteristics)

<10%

# Brookfield Infra Fund Performance




**Brookfield's core-plus infra funds have outperformed the DJ Brookfield Global Infra Index.**

vs Dow Jones Brookfield Global Infra Index

# Brookfield Super-Core Infrastructure Partners Terms

| Summary Terms | |
|---|---|
| **Commitment:** | $200 million |
| **GP Commitment:** | At least $50 million |
| **Fund structure:** | Open-ended; perpetual term |
| **Management Fee:** | 73 bps blended at $200 million commitment level |
| **First Close Economics:** | 10% discount on management fee for 5 years |
| **Performance Fee:** | 5% of distributions from operations |
| **Est RSIC Closing Date:** | November 7, 2018 |
| **LPAC Seat:** | Yes |
| **Liquidity** | Initial 3-year lock-up; quarterly liquidity thereafter |

RSIC RETIREMENT SYSTEM INVESTMENT COMMISSION

# Owl Rock Technology Finance Corporation (Tech BDC)

Steve Marino, CFA
Alan Bevard

# Owl Rock Technology Finance Corp. - Investment Summary

| **Investment Summary** | | | |
|---|---|---|---|
| **Target Net Return** | 11-17% net return to investors | | |
| **Est. Current Income** | 10-12% net yield | | |
| **Seed economics** | 1.33% ownership of BDC Management Company | | |
| **Assets** | Loans to private equity and venture capital backed technology and business services companies | | |
| | **Private Credit** | **Growth Lending** | **Yield Enhanced** |
| **% of Portfolio** | 75% | 15-30% | Up to 10% |
| **Return Target** | 8-10% | 10-15% | 15%+ |
| **Lending Base** | EBITDA | Revenue | Both |
| **Loan to Value** | 30-60% | 20-40% | 5-25% |
| **Diversification** | Targeting 60-90 positions | | |
| **Portfolio Level Leverage** | 1:1 Average Debt to Equity Ratio | | |
| **Equity Capital Raise** | $5 billion | | |

# The components of the investment:

- **Owl Rock Technology Finance Corp – Private BDC**
- **Owl Rock Technology Holding LLC** – seed economics (profit share) with Owl Rock Tech Midco.

| | Owl Rock Technology Holding LLC (Seed Economics) | Owl Rock Technology Finance Corp (Tech BDC) | RSIC Combined Target Return |
|---|---|---|---|
| Cash Yield: | 1-2.5% | 10-12% | 11-14.5% |
| Capital Appreciation: | | 0-3% | 0-3% |
| **Target Total Return:** | | | **11-17.5%** |

# Firm and Investment Review

**Existing Relationship for RSIC Private Debt**

- Currently invested in Owl Rock Capital Corp ("ORCC") and First Lien Fund ("FLF")
- Allocation moves Private Debt Portfolio towards the Asset Class Baseline target to direct lending of 75% from 50% currently

**Firm**

- Owl Rock Capital Partners LP was formed in 2015 by Doug Ostrover (co-founder of GSO), and partners with over 25 years average experience across public and private credit
- $9.5 billion of invested assets across four products (ORCC, ORCC II, FLF, and Tech BDC)

**Investment Thesis**

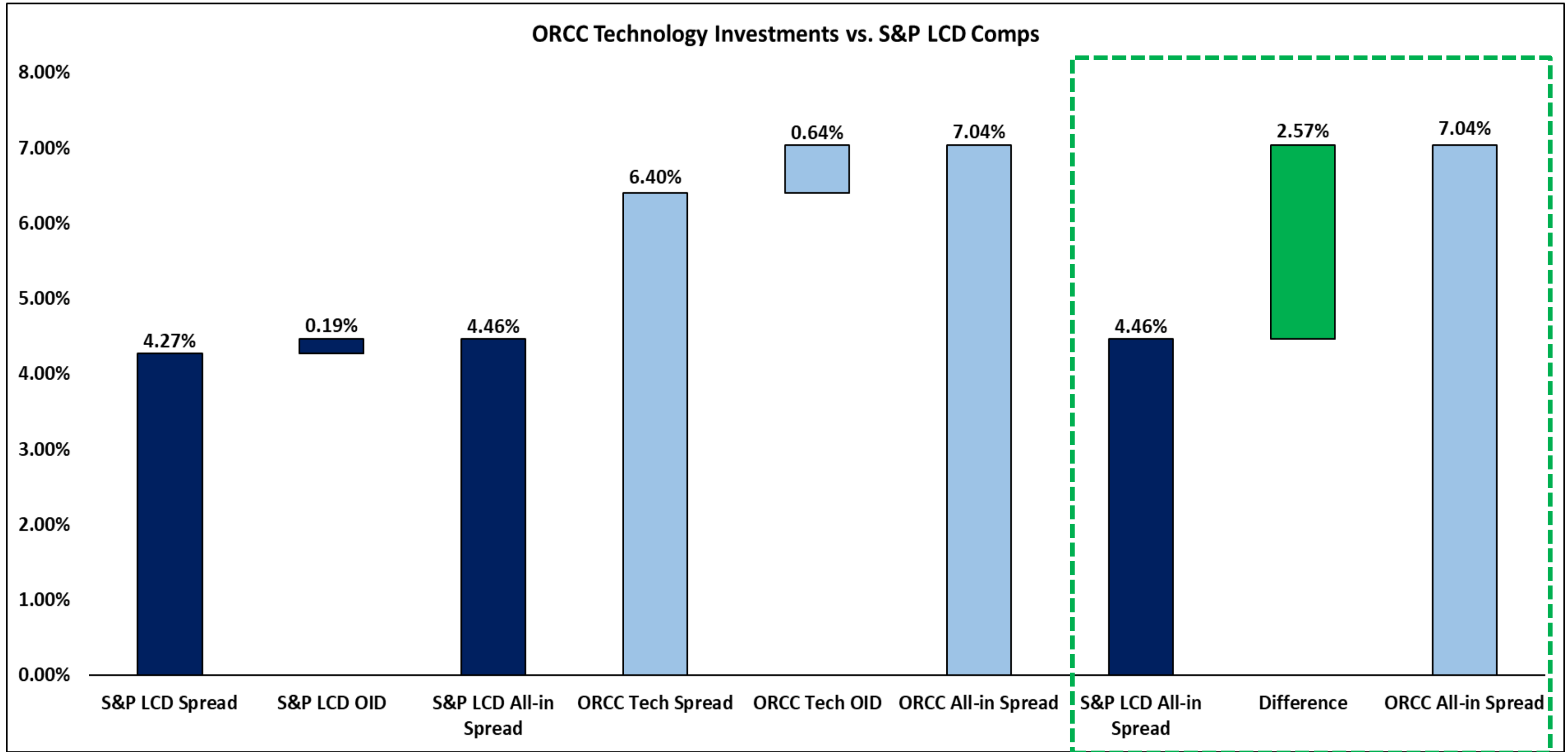
- Large sourcing engine with growing Menlo Park Office
- Opportunity to provide financing to technology and software businesses who are adopting the use of leverage in their capital structure
- Technology businesses have had strong historical credit performance relative to market
- Seed economics provide enhanced yield as business and platform grows

**Considerations**

- Lending to asset-lite businesses
- New product line, potential failure to launch
- BDC management fees and carried interest are higher than market

*as of 9/30/2018

# ORCC Technology Yield vs. Industry Comps




| | Return | | | Risk | | | | | Financial Performance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Spread | OID (3 Year Amort.) | All-in Spread | Total Leverage | Spread/Turn of Total Leverage | EV Multiple | LTV | Interest Coverage | Revenue | EBITDA | EBITDA Margin |
| ORCC Technology Investments | 6.40% | 0.64% | 7.04% | 6.56x | 1.07% | 15.2x | 42% | 2.1x | 310.2 | 77.7 | 33% |
| S&P LCD Comps | 4.27% | 0.19% | 4.46% | 5.23x | 0.85% | N/A | N/A | 3.4x | 236.0 | 58.1 | 25% |
| Difference | 2.13% | 0.44% | 2.57% | 1.33x | 0.22% | N/A | N/A | -1.3x | 74.2 | 19.6 | 8% |

*Owl Rock Par Weighted

Source: Owl Rock, S&P LCD

# Summary Terms

| Summary Terms | |
|---|---|
| **Commitment:** | $100 Million |
| **Fund Size:** | Target BDC fundraise of $5bn |
| **Investment Period:** | Open-ended vehicle, private → IPO 3-4 year target |
| ***Pre-IPO Investment Economics*** | |
| **Management Fee:** | 90bps on Invested Capital and Aggregate Unpaid Commitments |
| **Carried Interest:** | 10% |
| **Preferred Return:** | 6% |
| ***Post-IPO Investment Economics*** | |
| **Management Fee:** | 150bps on Invested Capital |
| **Carried Interest:** | 17.5% |
| **Preferred Return:** | 6% |
| ***Seed Economics*** | |
| **Pre-IPO ONLY** | Additional 60bps on Invested Capital during Pre-IPO period, 0% after listing |
| **Pre-IPO ONLY** | Additional 7.5% carried interest during Pre-IPO period, 0% after listing |
| **Profit Share** | 1.33% interest in Owl Rock Tech BDC Management Company in Perpetuity |

# South Carolina Retirement System Investment Commission

## Revision to Policy Benchmark

M E K E T A I N V E S T M E N T G R O U P
100 LOWDER BROOK DRIVE SUITE 1100 WESTWOOD MA 02090
781 471 3500 fax 781 471 3411 www.meketagroup.com

## Background

- In late 2018, RSIC Staff and Meketa Investment Group had a few conversations about the portable alpha benchmark and its role within the total system policy benchmark.
- We recommend the following change within the policy benchmark[1].

| From | To |
|---|---|
| Weight x T-Bills +250 bps | Weight x 250 bps |

## Rationale

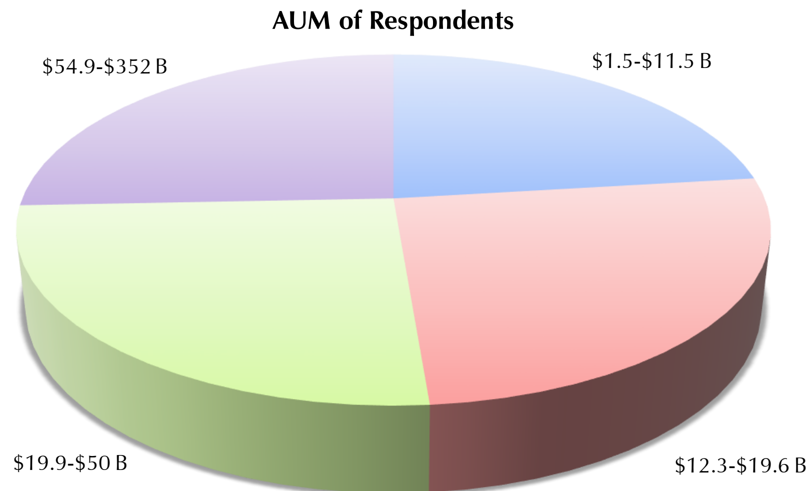
- The collateral for the overlay is not sitting in cash, so it is not earning the T-Bills rate.
- The collateral is invested elsewhere – i.e. in uncorrelated portable alpha hedge funds.
- We expect the portable alpha hedge funds (in isolation) to outperform a benchmark of T-Bills +250 bps.
- Because RSIC is not earning the T-Bill rate on the collateral, you need to subtract that from the total return expectation.
- When viewed together the net effect is the following (assuming a 10% exposure to portable alpha):
- Calculation: (10% x T-Bills + 250 bps) – (10% x T-Bills) = 10% x 250 bps.

[1] This change is only applicable to the policy benchmark, not the individual benchmark of portable alpha hedge funds on its own.

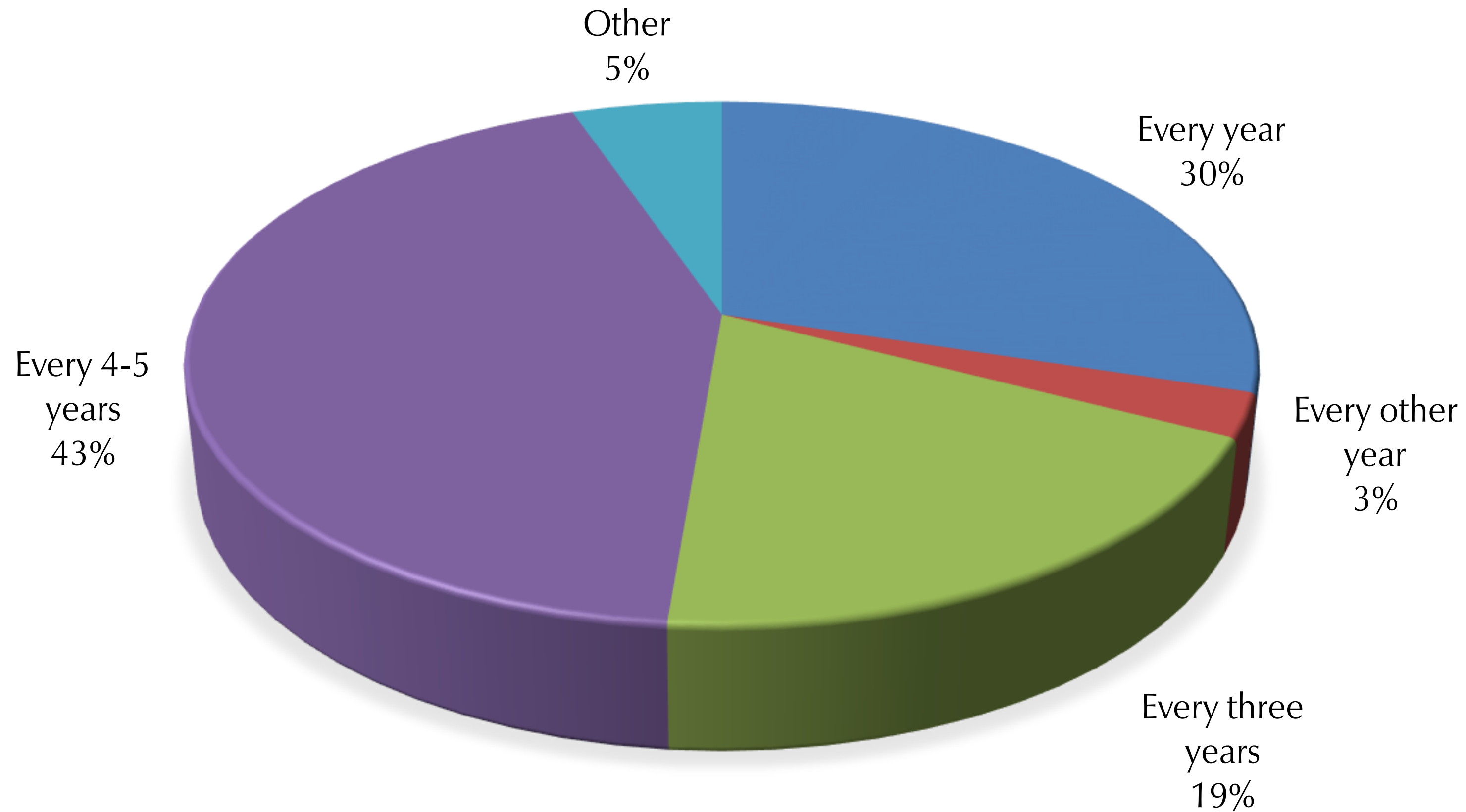
# A Survey and Review of Asset Allocation Best Practices

## Survey Introduction

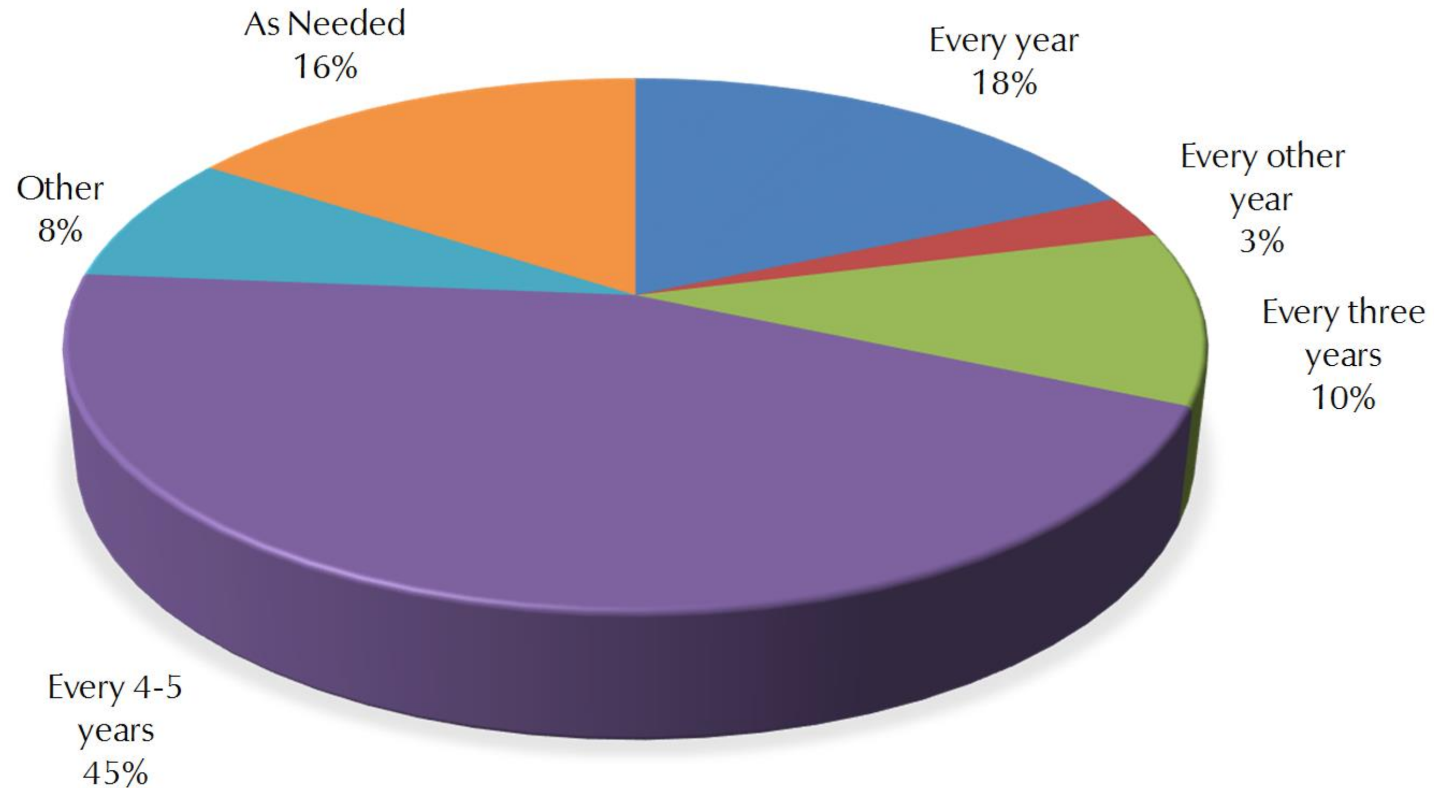
- Meketa, along with Staff of a large public fund, developed a survey to get a sense of how other public plans are doing asset allocation.
- We partnered with NASRA, who sent the survey to their members (US-based public pension systems).
- The survey was conducted in September 2018, and 39 plans responded.
- The following slides review the results of the survey.



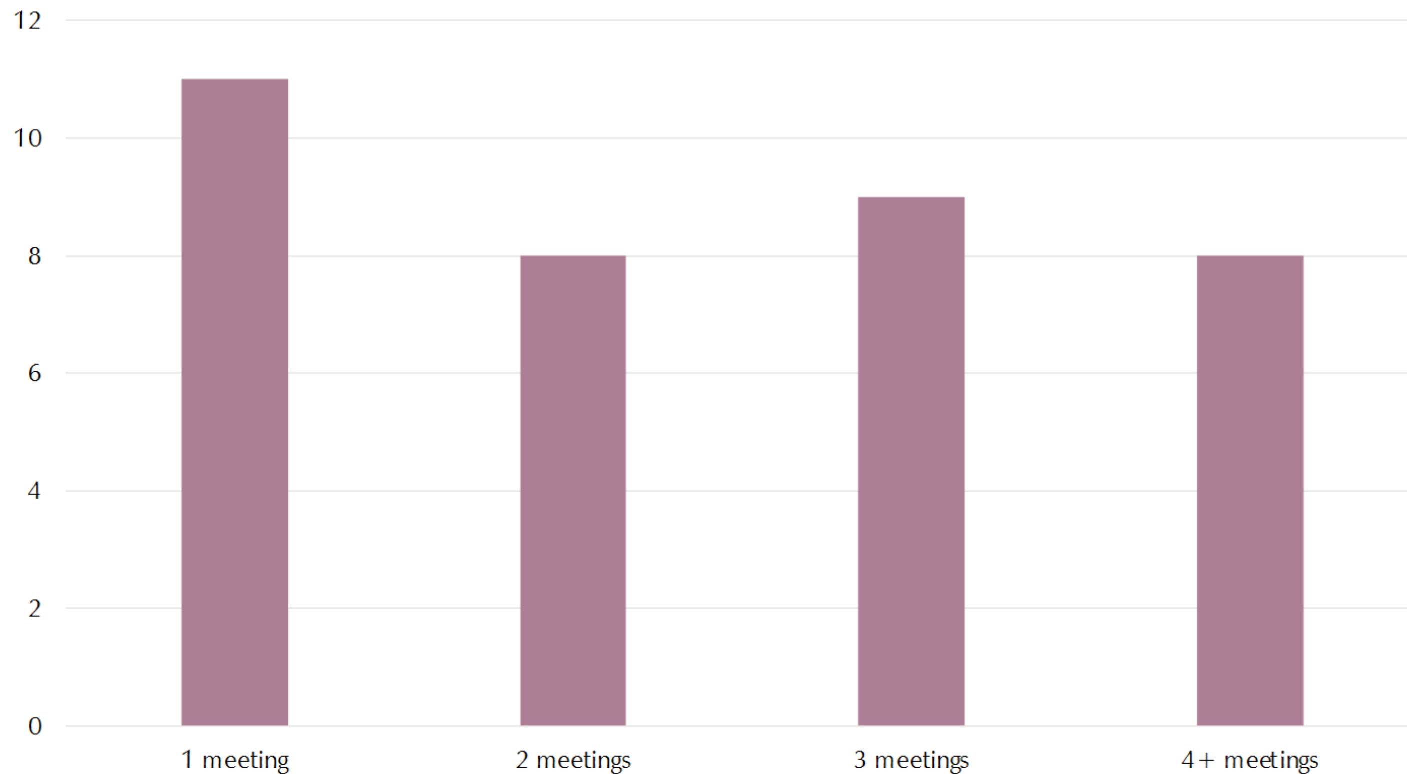
1. How frequently do you *review* the strategic asset allocation of your plan?



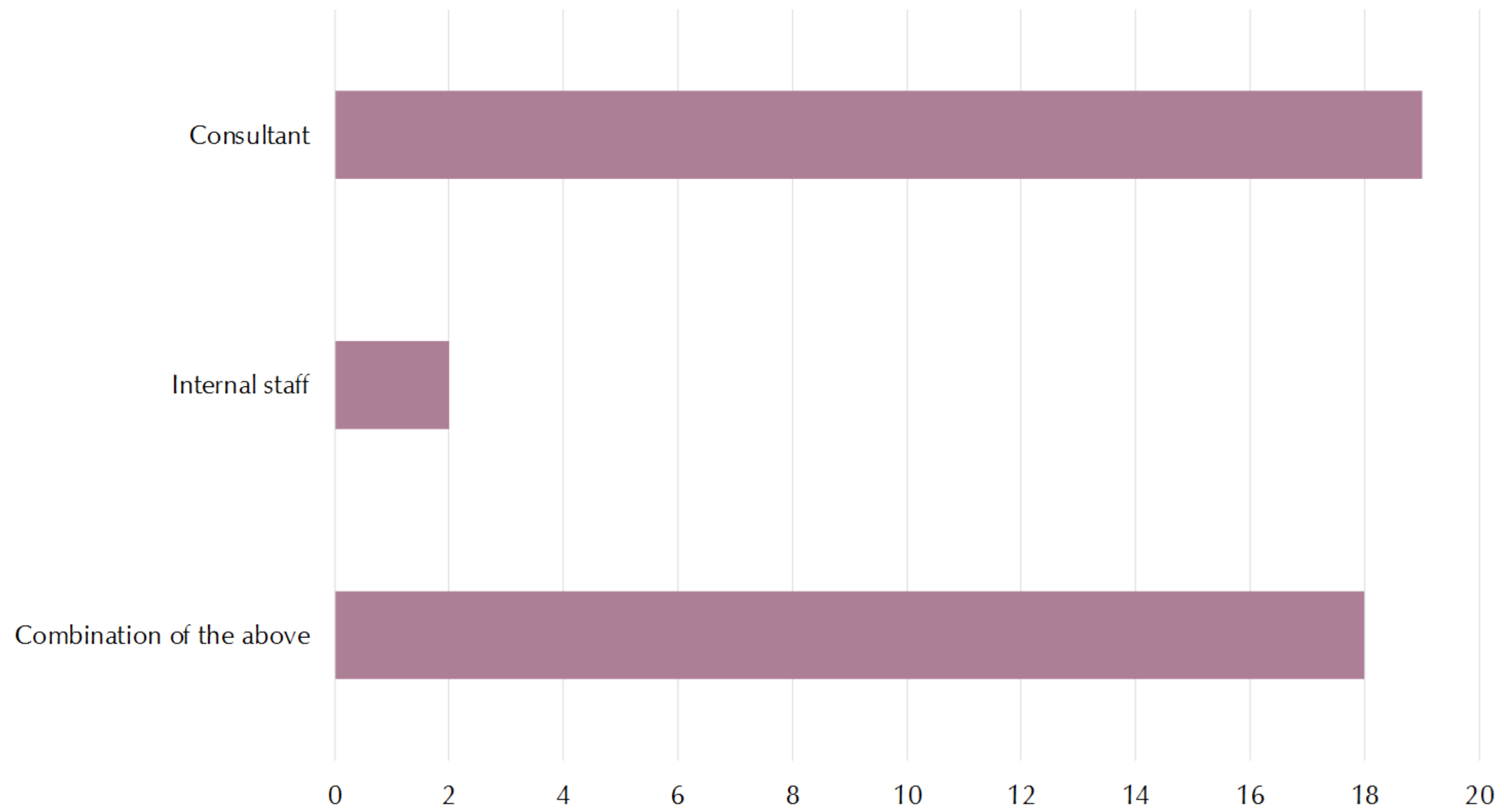
2. How frequently do you make changes to the asset allocation policy?



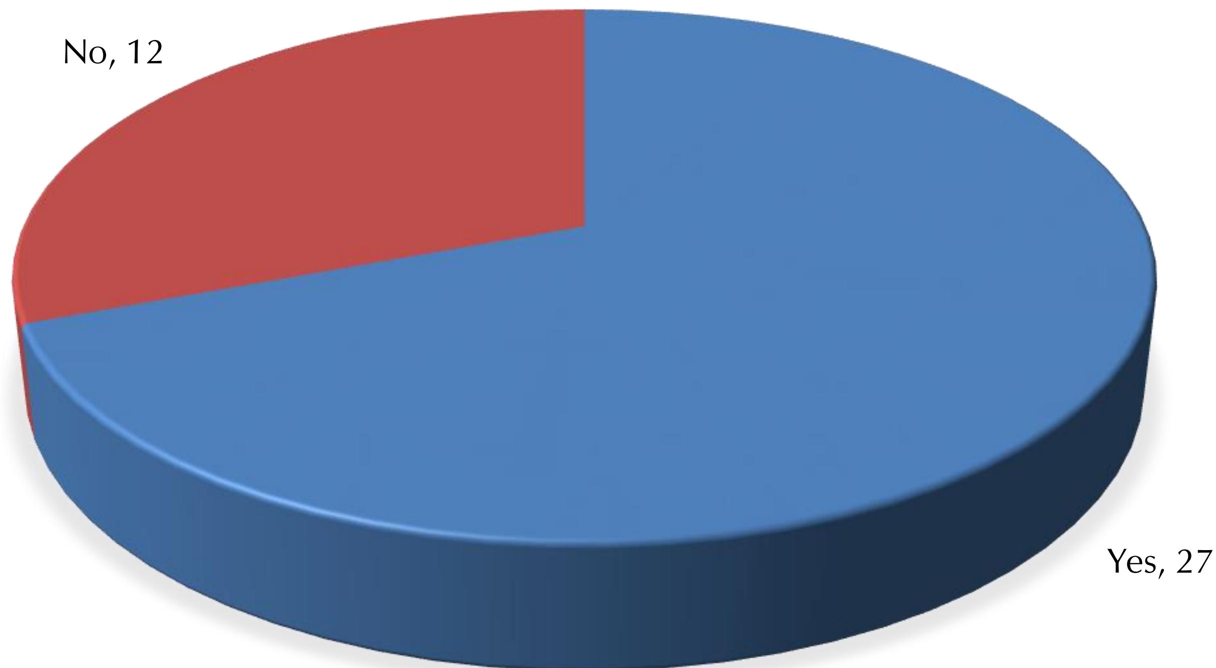
3. How many Board/Investment Committee meetings are dedicated to the asset allocation review process?



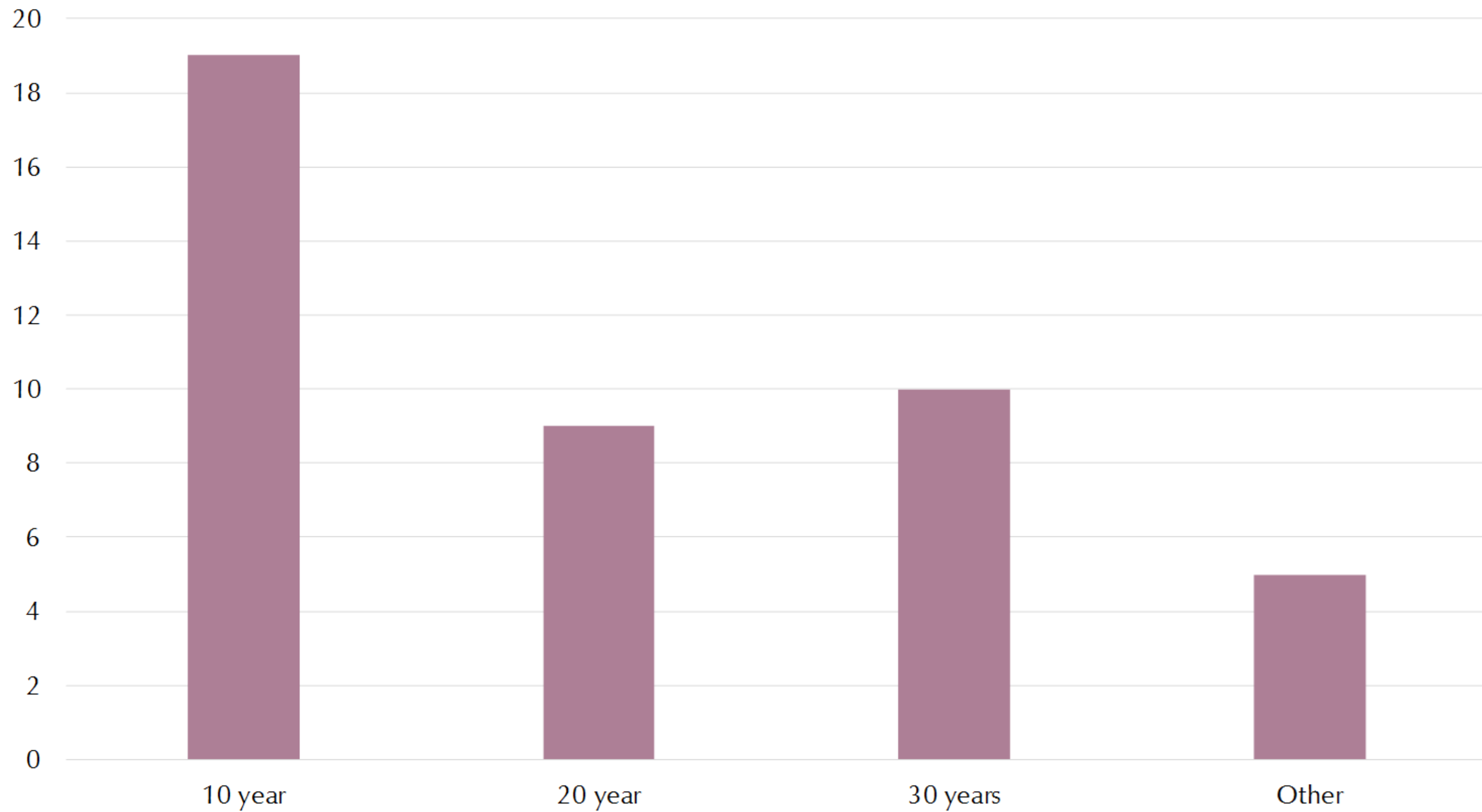
4. Whose capital market assumptions do you use?



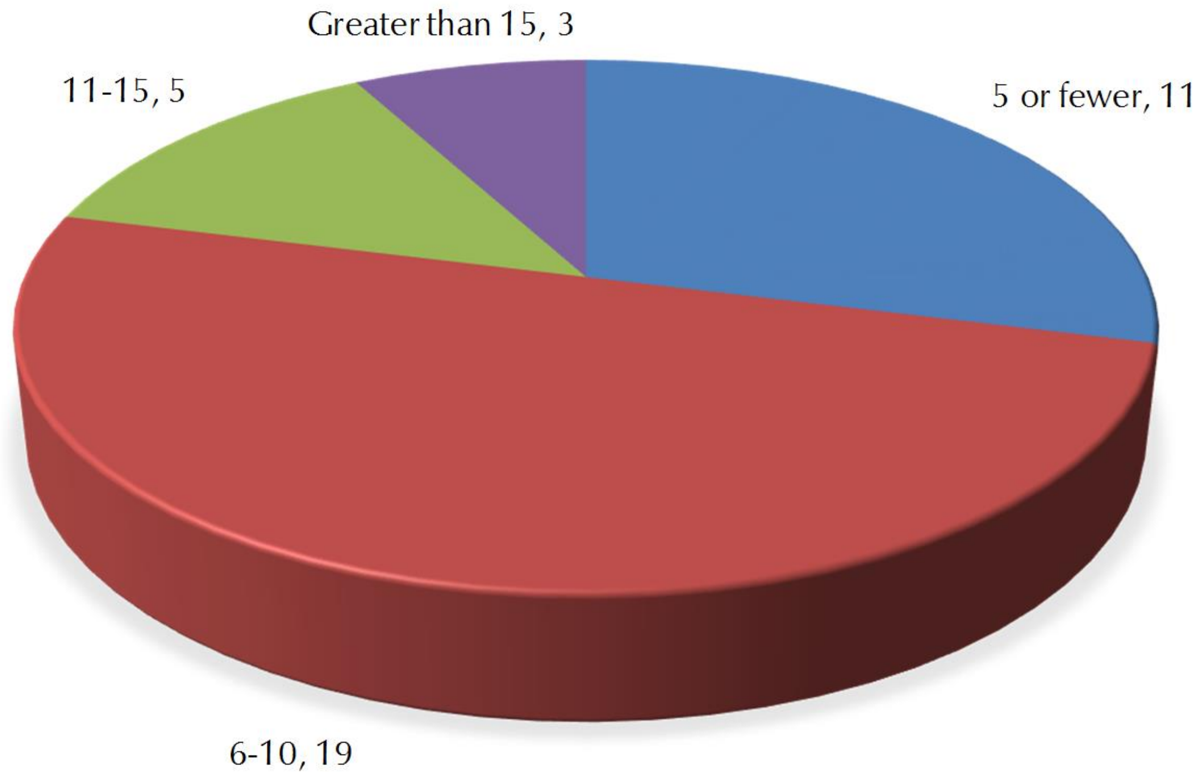
5. Does the Board/Investment Committee analyze how the capital market assumptions are created?



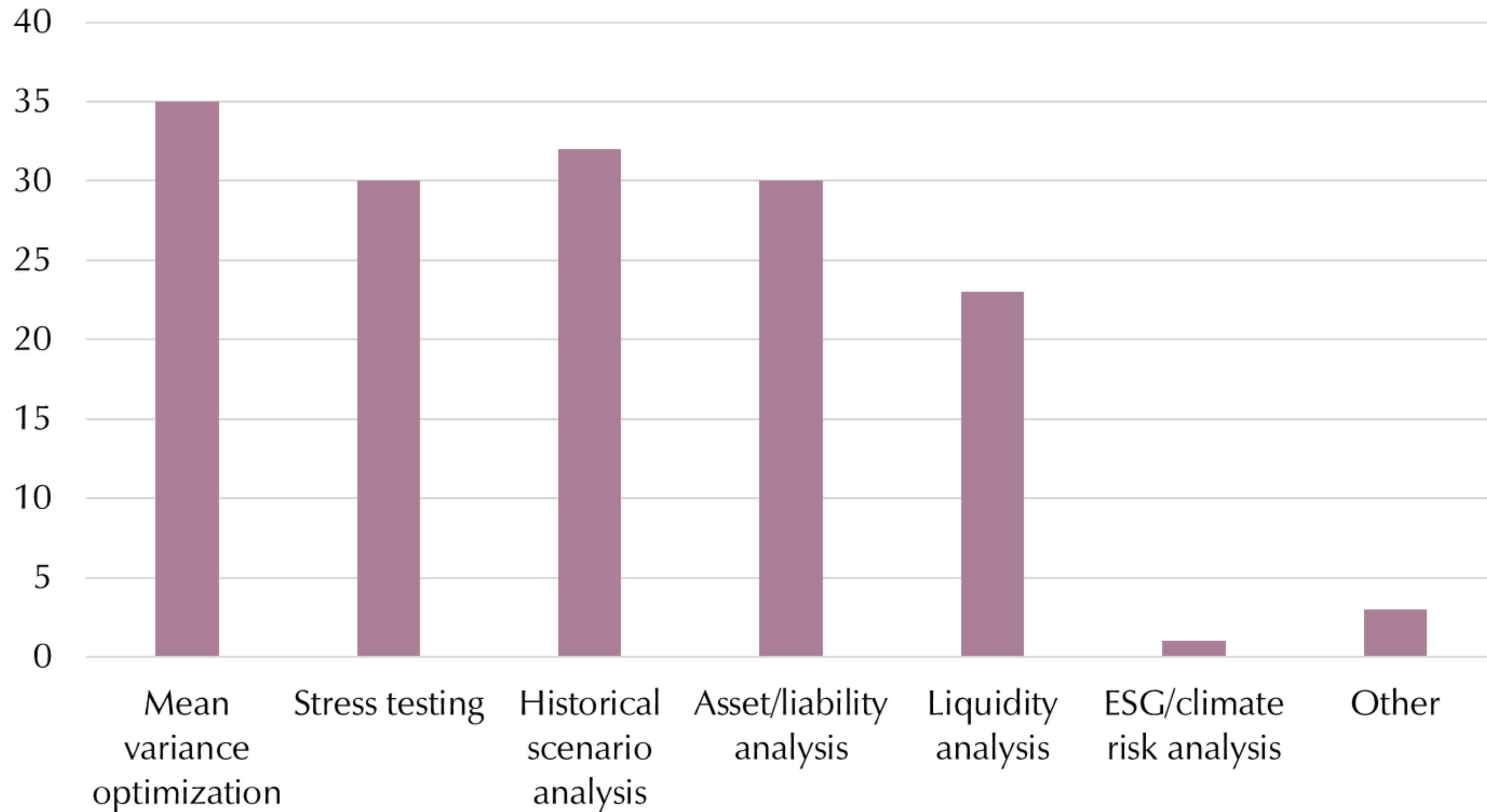
6. Please check the time horizon for the capital market assumptions you use:



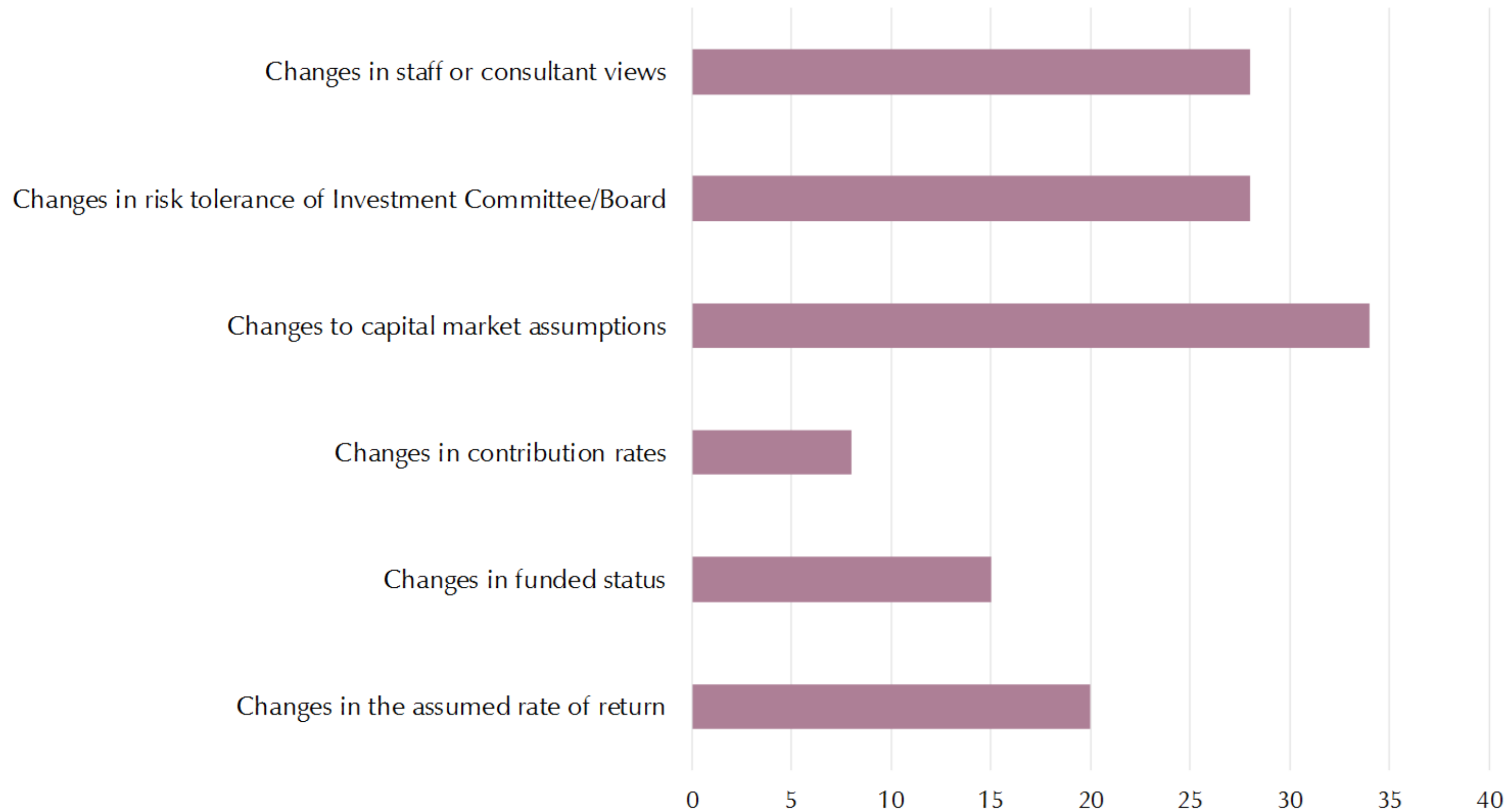
7. For how many asset classes do you set policy targets?



8. What type of risk analyses does your staff/consultant conduct as part of the asset allocation review process? Check all that apply:

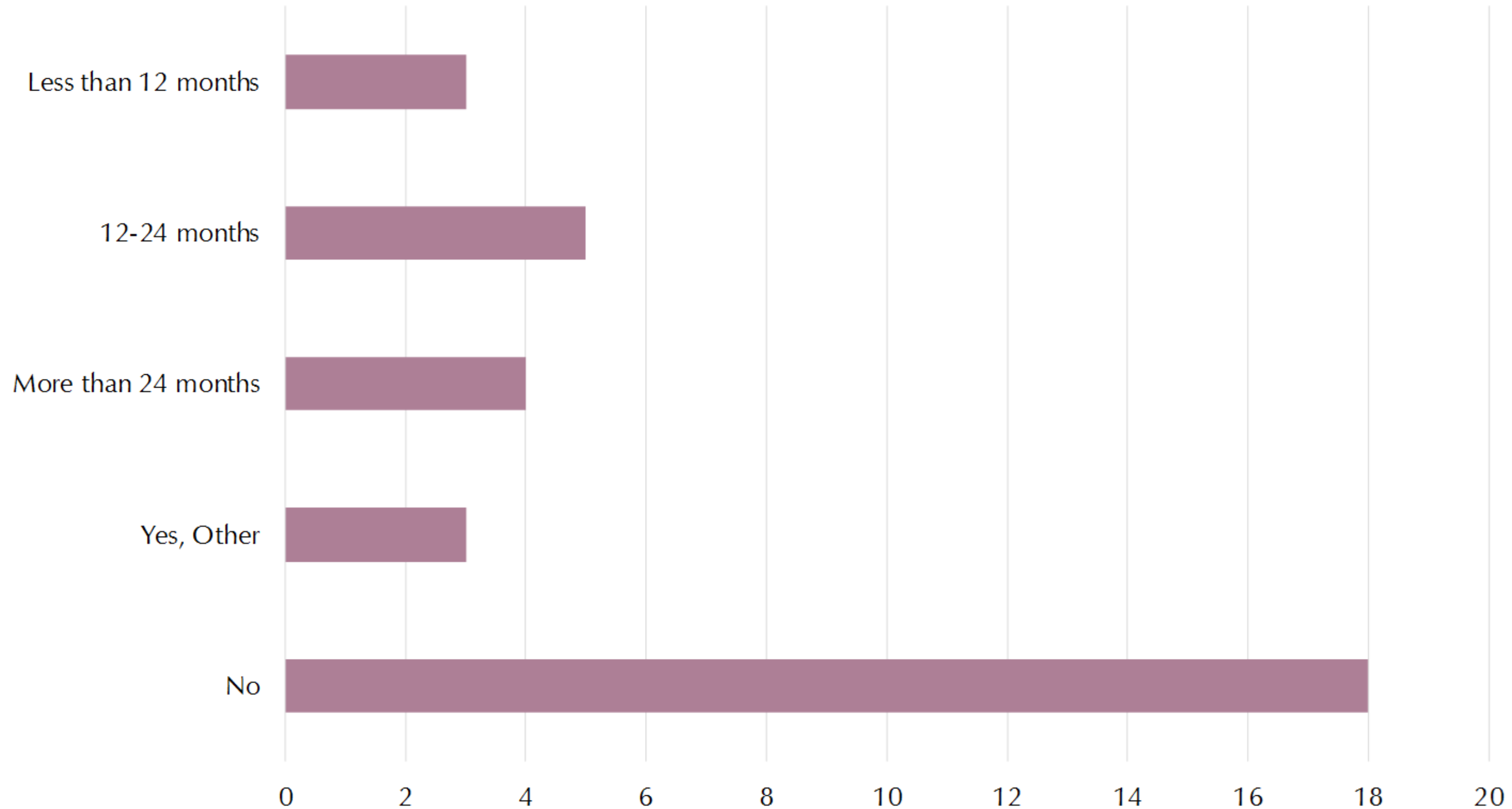


9. What drives the changes to the asset allocation policy? Check all that apply:



10. Which of the following factor into determining the size of the target range? Check all that apply:

11. When adopting a new asset allocation policy, do you set interim policy targets? If yes, what is the time frame for which interim policy targets can be in place?



## Conclusions

- Less than one-third of plans review their asset allocation every year, and less than one-quarter make changes.
- The majority of plans have more than one meeting to address asset allocation.
  - The majority also say that they analyze how the capital markets assumptions are created.
- There is a fairly even split on using a 10-year versus a 20+year horizon.
  - Actuaries tend to favor strongly the longer horizon.
- The vast majority set targets for ten or fewer asset classes.
  - The definition of an “asset class” matters here.
- There are many different but common factors that drive changes:
  - Turnover, capital market assumptions, actuarial target, etc.
- The vast majority do not set any kind of minimum threshold for making a change.
- Nearly half the plans set interim targets when making a change.

## Recommendations

- Define and set explicit (preferably quantifiable) objectives.
  - Agreeing on objectives will provide direction to staff/consultants and uniformity of purpose.
- Change to a schedule of reviewing the strategic asset allocation policy targets every 3-5 years.
  - This should help avert the basic human tendency whereby we feel compelled to make a change.
- Plan for a 2-3 meetings to discuss asset allocation.
  - This will allow for an iterative process, for the Commission to “dig in,” and for the Commission to have greater conviction in the eventual decision.
- Set targets and ranges for asset classes, and limits for sub-asset classes, with an eye toward what this implies for staff, who will be implementing the portfolio.
  - This will provide staff appropriate guidance.
- Continue to set interim targets when making changes.
  - This allows for a fair comparison to benchmarks and thoughtful implementation.
- Document reasons for the objectives and policy chosen; also, share these with new members when they join the Commission.
  - Understanding the reasoning behind prior decisions will help inform future decisions.

# Appendix: Survey Commentary Case Study

## Additional Commentary Provided In Survey Responses

- "Our system has historically relied upon a consultant-driven, MVO-oriented approach that sets static targets. Going forward the Board is considering a more flexible and dynamic framework that is less reliant on MVO and CMAs, including the potential for Staff to rebalance the portfolio to manage risk and return."
- "Asset allocation has to be performed in conjunction with asset liability modeling work from your actuary, in at least five year review periods, to arrive at the most informed point of board decision making that sets the allocation for an expected five year period. You can always revisit both major topics depending on results and conditions year over year (great recession) but with bands set to keep discipline with regard to rebalancing over the next five year period."
- "We have a different view of the asset/liability review process. We have had a certain market posture for a number of decades -- one that has proven and lasted through three crises and has demonstrated that it satisfies the risk tolerance of our system (Board, legislature, administration, constituents, etc.). We use the asset/liability process to determine whether that proven posture is still appropriate -- and, so far, it has proven to be well within acceptable ranges (and need not be changed). Other systems apparently use the process to discover what allocation fits the risk/return tolerance -- as a discovery tool. We have an allocation that has been demonstrated to fit our risk return tolerance, and we simply want to know if under a current broad range of assumptions whether it is still in the appropriate range."
- "Process here provides significant opportunities for public involvement and comment along with explicit inclusion of actuarial considerations."

## Case Study: CalSTRS

- CalSTRS conducts their asset allocation policy review every five years.
- The most recent review, in 2015, occurred over the course of five meetings, as outlined below:

| Investment Committee Meeting | Asset Allocation Study Steps |
|---|---|
| April | • Review asset classes used in modeling process |
| June | • Adopt capital market assumptions |
| July | • Select asset class optimization constraints |
| September | • Model risk and return characteristics of policy portfolio options |
| November | • Select new asset allocation targets |

- Staff and their consultants (including specialists) worked collaboratively throughout the process.
  - They developed unique asset class definitions and a distinct set of capital markets expectations.
- The Investment Committee reviewed and approved each step at the requisite meeting.
- Staff has discretion to vary from targets within pre-approved ranges.

# Meketa Investment Group

# 2019 Capital Markets Expectations

**Each year, we review and set our capital market expectations.**

- This involves setting long-term expectations for a variety of asset classes for:
  - Returns
  - Standard Deviation
  - Correlations
- Our process relies on both quantitative and qualitative methodologies.
- This document represents a selection of information and results from our 2019 Annual Asset Study.

## Asset Class Definitions

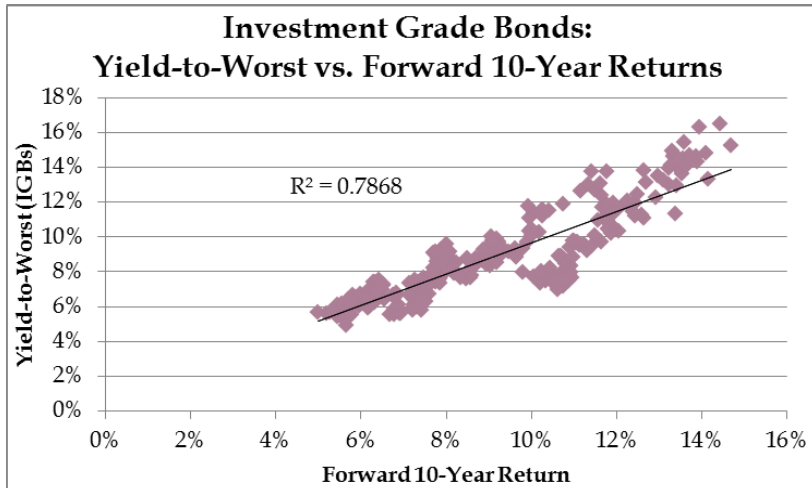
- Meketa Investment Group utilizes an approach that identifies asset classes and strategies that are appropriate for long-term allocation of funds, and that also are investable.
- Three considerations influence this process: unique return behavior, an observable historical track record, and a robust market.
- We then make forecasts for each unique asset class or strategy.

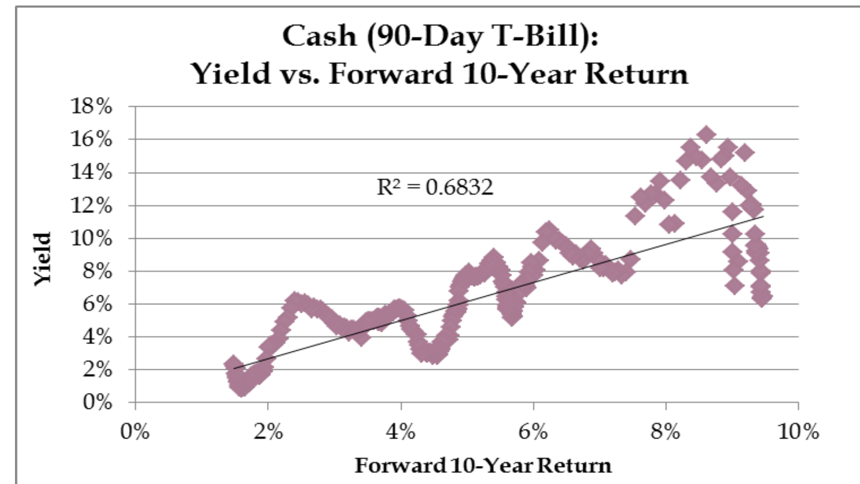
## The first step is to build our 10-year forecasts

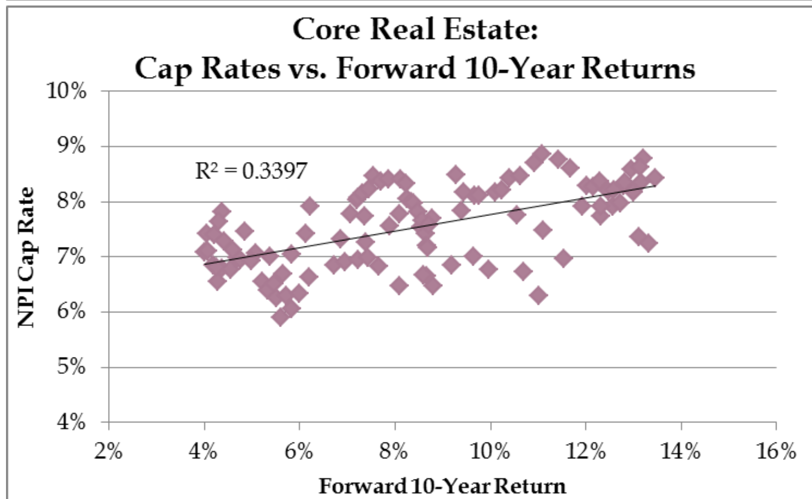
- Our fundamental models are primarily valuation based
  - Each model falls in one of eight groups, based on the most important factors that drive their returns:

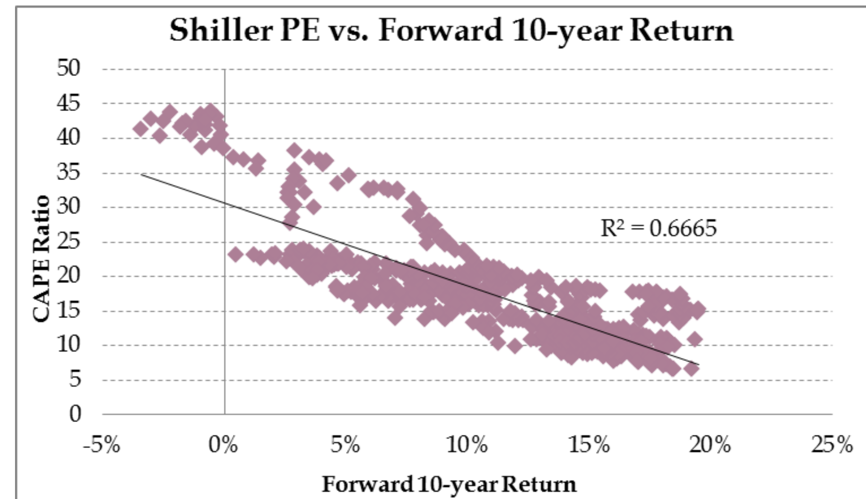
| Asset Class Category | Major Factors |
|---|---|
| Equities | Dividend Yield, GDP Growth, Valuation |
| Bonds | Yield to Worst, Default Rate, Recovery Rate |
| Commodities | Collateral Yield, Roll Yield, Inflation |
| Infrastructure | Public IS Valuation, Income, Growth |
| Natural Resources | Price per Acre, Income, Public Market Valuation |
| Real Estate | Cap Rate, Yield, Growth |
| Private Equity | EBITDA Multiple, Debt Multiple, Public VC Valuation |
| Hedge Funds and Other | Leverage, Alternative Betas |

## Some models are naturally more predictive than others



## The next step is to move from 10-year to our 20-year forecasts

- We do this by combining our 10-year forecasts with the historical returns for each asset class.
  - How much we apply to each depends on our confidence in them (both the model & the data).
    - The 10-year model weighting varies between 50% and 100%.
    - It only hits 100% when there is a lack of reliable historical data.
- We then infer a forecast of 10-year returns in ten years (i.e., years 11-20).
  - This allows us to test our assumptions with finance theory.
  - Essentially, we assume mean-reversion over the first ten years (where appropriate), and consistency with CAPM thereafter.

## The final step is to make any qualitative adjustments

- The Investment Committee reviews the output and may make adjustments due to:
  - Quality of the underlying data
  - Confidence in each model
  - External inputs (e.g., perceived risks)

## Capital Market Assumption Development Example: Equities

- We use a fundamental model for equities that combines income and capital appreciation.

***E(R)=Dividend Yield + Expected Earnings Growth + Multiple Effect + Currency Effect***

- Meketa Investment Group evaluates historical data statistically to develop expectations for dividend yield, earnings growth, the multiple effect and currency effect.
- Our models assume that there is a reversion to the mean pricing over long time periods.

## Capital Market Assumption Development Example: Bonds

- The short version for investment grade bond models is:

***E(R)=Current YTW (yield to worst)***

- Our models assume that there is a reversion to the mean for spreads (though not yields).
- For TIPS, we add the real yield of the TIPS index to the breakeven inflation rate.
- As with equities, we make currency adjustments when necessary for foreign bonds.
- For bonds with credit risk, Meketa Investment Group estimates default rates and loss rates in order to project an expected return:

***E(R)= YTW - (Annual Default Rate × Loss Rate)***

## The other inputs: standard deviation and correlation

- Standard deviation:
  - We review the trailing fifteen-year standard deviation, as well as skewness.
  - Historical standard deviation serves as the base for our assumptions.
  - If there is a negative skew, we increased the volatility assumption based on the size of the historical skewness.

| Asset Class | Standard Deviation | Skewness | Assumption |
|---|---|---|---|
| Bank Loans | 6.6% | -2.3 | 9.0% |

  - We also adjust for private market asset classes with "smoothed" return streams.
- Correlation:
  - We use trailing fifteen-year correlations as our guide.
  - Again, we make adjustments for "smoothed" return streams.
- Most of our adjustments are conservative in nature (i.e., they increase the standard deviation and correlation).

# Fixed Income

| | 2019 E(R) (%) | 2018 E(R) (%) | Δ from 2018 (%) | Notes |
|---|---|---|---|---|
| Cash Equivalents | 2.9 | 2.9 | 0.0 | |
| Short-term Investment Grade Bonds | 3.4 | 3.1 | 0.3 | Higher yields |
| Investment Grade Bonds | 3.9 | 3.6 | 0.3 | Higher yields |
| Intermediate Government Bonds | 3.1 | 2.7 | 0.4 | Higher yields |
| Long-term Government Bonds | 3.7 | 3.5 | 0.2 | Higher yields, flatter curve |
| TIPS | 3.6 | 3.3 | 0.3 | Higher real yields |
| High Yield Bonds | 6.5 | 5.4 | 1.1 | Much higher yields and wider spread |
| Bank Loans | 6.1 | 5.0 | 1.1 | Higher yields (and no more drag from floors) |
| Foreign Bonds | 2.3 | 2.1 | 0.2 | Slightly higher yields |
| Emerging Market Bonds (major) | 5.2 | 4.9 | 0.3 | Higher yields |
| Emerging Market Bonds (local) | 5.3 | 5.4 | -0.1 | Slightly lower yields |
| Private Debt Composite | 7.3 | 6.7 | 0.6 | Higher yields and lower fee impact |
| Direct Lending – First Lien | 6.7 | 5.7 | 1.0 | higher yields and slightly wider spreads |
| Direct Lending – Second Lien | 7.9 | 7.3 | 0.6 | higher yields |
| Mezzanine Debt | 7.2 | 6.6 | 0.6 | higher yields and lower fee impact |
| Distressed Debt | 7.3 | 6.6 | 0.7 | lower prices |

# Equities

| | 2019 E(R) (%) | 2018 E(R) (%) | Δ from 2018 (%) | Notes |
|---|---|---|---|---|
| US Equity | 8.1 | 7.3 | 0.8 | better valuations (lower prices and strong earnings in 2018) |
| US Large Cap | 8.1 | 7.4 | 0.7 | better valuations |
| US Mid Cap | 8.0 | 7.3 | 0.7 | higher divided, better valuations |
| US Small Cap | 8.3 | 7.2 | 1.1 | higher divided, better valuations |
| Dev. Market Equity (non-U.S.) | 8.5 | 7.1 | 1.4 | higher dividend, better valuations (strong earnings in 2018) |
| Developed Market Small Cap | 7.7 | 6.3 | 1.4 | higher dividend, better valuations |
| Emerging Market Equity | 10.4 | 9.4 | 1.0 | higher dividend, better valuations (good earnings) |
| Emerging Market Small Cap | 9.9 | 9.0 | 0.9 | higher dividend, better valuations |
| Frontier Market Equity | 10.3 | 8.9 | 1.4 | higher dividend, better valuations |
| Global Equity | 8.6 | 7.5 | 1.1 | higher dividend, better valuations |
| Private Equity | 10.1 | 9.3 | 0.8 | lower fee impact and lower prices |
| Buyouts | 10.1 | 9.3 | 0.8 | lower fee impact and lower prices |
| Venture Capital | 10.0 | 9.2 | 0.8 | better pricing for tech & healthcare |

## Real Assets

| | 2019 E(R) (%) | 2018 E(R) (%) | Δ from 2018 (%) | Notes |
|---|---|---|---|---|
| Real Estate | *7.0* | 6.7 | 0.3 | More leverage and lower fee impact expected |
| REITs | 7.0 | 6.8 | 0.2 | Lower prices partially offset by lower income growth |
| Core Private Real Estate | 5.8 | 5.5 | 0.3 | Higher income assumption (using transaction cap rates) |
| Value-Added Real Estate | 7.5 | 6.9 | 0.6 | More leverage and lower fee impact expected |
| Opportunistic Real Estate | 9.1 | 8.5 | 0.6 | Lower fee impact expected |
| Natural Resources (Public) | 9.0 | 7.2 | 1.8 | Much lower prices |
| Natural Resources (Private) | *9.5* | 8.8 | 0.7 | Lower prices |
| Commodities | 5.0 | 4.6 | 0.4 | Higher cash (collateral) yield |
| Infrastructure (Public) | 8.2 | 7.2 | 1.0 | Lower prices |
| Infrastructure (Core Private) | 6.5 | 6.6 | -0.1 | Higher borrowing costs, lower income, lower fee impact |
| Infrastructure (Non-Core Private) | 8.8 | 8.5 | 0.3 | Lower fee impact |

# Alternative Strategies (Other)

| | 2019 E(R) (%) | 2018 E(R) (%) | Δ from 2018 (%) | Notes |
|---|---|---|---|---|
| Hedge Funds | 5.4 | 5.2 | 0.2 | better equity valuations & higher yields, flatter curve |
| Long-Short | 5.0 | 4.4 | 0.6 | better equity valuations, higher cash yields |
| Event Driven | 6.3 | 5.9 | 0.4 | better equity valuations, higher cash yields |
| Global Macro | 5.2 | 5.3 | -0.1 | cheaper equities & wider spreads, offset by flatter curve |
| CTA – Trend Following | 5.4 | 4.6 | 0.8 | higher volatility manifesting in higher trend potential |
| Fixed Income/L-S Credit | 4.9 | 4.2 | 0.7 | higher spreads |
| Relative Value/Arbitrage | 5.5 | 6.0 | -0.5 | flatter curve |
| Risk Parity (10% vol) | 6.2 | 5.6 | 0.6 | higher yields, better equity valuations |
| TAA | 5.1 | 4.6 | 0.5 | higher yields, better equity valuations |
| U.S. Inflation | 2.6 | 2.7 | -0.1 | |

# Peer Study

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.
- In the 2018 survey there were 34 respondents[1].
- The Horizon survey is a useful tool for Board members to determine whether their consultant's expectations for returns (and risk) are reasonable.

| Asset Class | 10-Year Average (%) | 20-Year Average (%) | MIG 20-Year (%) |
|---|---|---|---|
| U.S. Equity (large cap) | 6.1 | 7.4 | 7.3 |
| Non-U.S. – Developed | 6.7 | 7.7 | 7.1 |
| Non-U.S. – Emerging | 7.6 | 8.8 | 9.4 |
| U.S. Corporate Bonds – Core | 3.4 | 4.5 | 4.2 |
| U.S Corporate Bonds – High Yield | 4.8 | 5.8 | 5.4 |
| Non-U.S. Debt – Developed | 2.2 | 3.2 | 2.1 |
| Non-U.S. Debt – Emerging | 5.0 | 6.1 | 5.4 |
| U.S. Treasuries (cash) | 2.5 | 3.1 | 2.9 |
| TIPS | 2.9 | 4.0 | 3.3 |
| Real Estate | 5.9 | 6.7 | 5.5 |
| Hedge Funds | 5.0 | 6.2 | 5.2 |
| Commodities | 4.0 | 4.9 | 4.6 |
| Infrastructure | 6.6 | 7.1 | 6.6 |
| Private Equity | 8.3 | 9.5 | 9.3 |
| Inflation | 2.2 | 2.5 | 2.7 |

[1] The 10-year horizon includes all 34 respondents and the 20-year horizon includes 13 respondents.

# South Carolina Retirement System Investment Commission

Asset Allocation Update

## Annual Asset Study

- The following table illustrates the changes in expected return for each sub asset class that the Retirement System is invested in.

## Expected Return Assumptions

| | Weight | | 2018 Study Return Assumptions (%) | 2019 Study Return Assumptions (%) | Return Difference (%) | Notes |
|---|---|---|---|---|---|---|
| Equities | 18% | U.S. Equity | 7.3 | 8.1 | +0.8 | Better valuations (lower prices) |
| | 11% | Developed Non-U.S. Equity | 7.1 | 8.5 | +1.4 | Higher dividend, Better valuations |
| | 6% | Emerging Markets Equity | 9.4 | 10.4 | +1.0 | Higher dividend, Better valuations |
| | 7% | Equity Options (Put Write) | 6.9 | 7.1 | +0.2 | Slightly higher volatility |
| | 9% | Private Equity | 9.3 | 9.6 | +0.3 | Lower fee impact |
| Rate Sensitive | 6% | Investment Grade Bonds | 3.6 | 3.9 | +0.3 | Higher yields |
| | 4% | Treasuries (Intermediate) | 2.7 | 3.1 | +0.4 | Higher yields |
| | 1% | Treasuries (Long-term) | 3.5 | 3.7 | +0.2 | Higher yields |
| | 2% | TIPS | 3.3 | 3.6 | +0.3 | Higher real yields |
| Credit | 2% | High Yield Bonds | 5.4 | 6.5 | +1.1 | Higher yields, Wider spreads |
| | 2% | Bank Loans | 5.0 | 6.1 | +1.1 | Higher yields |
| | 7% | Private Debt | 6.7 | 7.3 | +0.6 | Higher yields and lower fee impact |
| | 2% | Emerging Market Debt (local currency) | 5.4 | 5.3 | -0.1 | Slightly lower yields |
| | 2% | Emerging Market Debt (USD) | 4.9 | 5.2 | +0.3 | Higher yields |

## Expected Return Assumptions (continued)

| | Weight | | 2018 Study Return Assumptions (%) | 2019 Study Return Assumptions (%) | Return Difference (%) | Notes |
|---|---|---|---|---|---|---|
| Real Assets | 5% | Core Private Real Estate | 5.5 | 5.8 | +0.3 | Higher income assumption |
| | 3% | Value-Add Private Real Estate | 6.9 | 7.5 | +0.6 | More leverage and lower fee impact |
| | 1% | Public Real Estate (REITs) | 6.8 | 7.0 | +0.2 | Lower prices |
| | 1% | Core Private Infrastructure | 6.6 | 6.5 | -0.1 | Higher borrowing costs |
| | 1% | Non-Core Private Infrastructure | 8.5 | 8.8 | +0.3 | Lower fee impact |
| | 1% | Public Infrastructure | 7.2 | 8.2 | +1.0 | Lower prices |
| Opportunistic | 7% | Global Tactical Asset Allocation | 4.6 | 5.1 | +0.5 | Higher yields, lower equity prices |
| | 10% | Portable Alpha Hedge Funds | 5.3 | 5.3 | 0.0 | Higher yields, lower equity prices offset by flatter yield curve |
| | 1% | Risk Parity | 5.6 | 6.2 | +0.6 | Higher yields, lower equity prices |

## Current Target Allocation

| | Current Target (%) | Ranges (%) |
|---|---|---|
| **Rate Sensitive:** | **14** | **4-24** |
| Cash & Short-term Bonds | 1 | 0-7 |
| Core Bonds | 13 | 6-20 |
| **Credit:** | **15** | **10-20** |
| High Yield Bonds & Bank Loans | 4 | 0-8 |
| Private Debt | 7 | 3-11 |
| Emerging Market Debt | 4 | 2-6 |
| **Equities:** | **51** | **31-59** |
| Global Public Equity | 42 | 22-50 |
| Private Equity | 9 | 5-13 |
| **Real Assets:** | **12** | **7-17** |
| Real Estate | 9 | 5-13 |
| Infrastructure | 3 | 1-5 |
| **Opportunistic** | **18** | |
| Portable Alpha Hedge funds | 10 | 0-12 |
| Tactical Asset Allocation | 7 | 3-11 |
| Other Opportunistic & Risk Parity | 1 | 0-3 |
| *Non-U.S. Dollar Exposure* | *26* | |
| **Expected Return** | **8.04** | |
| **Standard Deviation** | **12.9** | |
| **Probability of Achieving 7.25% over 20 Years** | **60.4%** | |

## Summary - 2018 vs. 2019 Comparison

| | Expectations based on 2018 Asset Study (%) | Expectations based on 2019 Asset Study (%) | Difference From Prior Year (%) |
|---|---|---|---|
| Expected Return | 7.46 | 8.04 | +0.58 |
| Standard Deviation | 13.7 | 12.9 | -0.8 |
| Sharpe Ratio | 0.33 | 0.40 | +0.07 |
| Probability of Achieving 7.25% | 52.1 | 60.4 | +8.3 |

- Based on our 2019 capital market expectations, the portfolio's expected return (annualized over twenty years) increased by 0.58%, and the probability of hitting the assumed rate of return increased by 8.3%.

## Summary

- Return expectations for all assets increased year-over-year as a result of a variety of factors, including:
  - Better (lower) valuations for riskier assets (e.g., public equities).
  - Higher yields for bonds.

## Next Steps

- In April, Meketa Investment Group will present an asset allocation review.
  - We will continue to work with Staff in the interim to discuss possible changes.
  - These may include:
    - changes to the definition (and number) of asset classes,
    - changes to the benchmark(s) to be consistent,
    - and establishing appropriate target allocation ranges or limits for the underlying strategies in which staff could invest.

# Simplification Concept

## Introduction

- RSIC Staff and Meketa Investment Group have been discussing possible ways to simplify the asset allocation.
- The following pages highlight some preliminary analysis on a few illustrative asset mixes that contain a reduced number of asset classes.

## Simplified Asset Mixes[1]

| Current Target (%) | |
|---|---|
| Nominal IG Bonds | 6 |
| Treasuries | 5 |
| TIPS | 2 |
| Mixed Credit | 4 |
| Emerging Market Debt | 4 |
| Private Debt | 7 |
| U.S. Equity | 18 |
| Developed Intl | 11 |
| EM Equity | 6 |
| Equity Options | 7 |
| Private Equity | 9 |
| Real Estate (Public) | 1 |
| Real Estate (Private) | 8 |
| Infrastructure (Public) | 1 |
| Infrastructure (Private) | 2 |
| PA Hedge funds | 10 |
| GTAA | 7 |
| Other Opportunistic | 1 |

| Mix A (Simpler) (%) | |
|---|---|
| Core Bonds | 13 |
| Mixed Credit | 4 |
| Emerging Market Debt | 4 |
| Private Debt | 7 |
| Global Equity | 35 |
| Equity Options | 7 |
| Private Equity | 9 |
| Real Estate | 9 |
| Infrastructure | 3 |
| PA Hedge funds | 10 |
| GTAA | 8 |

| Mix B (Simplest) (%) | |
|---|---|
| Bonds | 25 |
| Private Debt | 7 |
| Global Equity | 46 |
| Private Equity | 9 |
| Real Assets | 12 |
| PA Hedge funds | 10 |

- The changes may include consolidating some of the opportunistic asset classes and many of the sub-targets within core bonds and public equities.

[1] Each asset mix assumes a 1% target to cash.

## Results (MVO Analysis)

| | Current Target (%) | Mix A (Simpler) | Mix B (Simplest) |
|---|---|---|---|
| Expected Return (10Y) | 7.34 | 7.23 | 7.33 |
| Expected Return (20 YR): | 8.04 | 7.94 | 8.04 |
| Standard Deviation: | 12.9 | 12.4 | 12.2 |
| Sharpe Ratio | 0.40 | 0.40 | 0.42 |
| Equity Contribution to Risk | 69.6% | 68.3% | 78.5% |

- From a pure MVO perspective, it is possible to simplify the asset allocation without sacrificing potential return and without accepting more volatility (as measured by Standard Deviation).
- Mix B (the "Simplest") appears to have the highest expected Sharpe Ratio. This is because it has the largest allocation designated as high quality bonds (which serve as a more efficient equity hedge).
- However, the way the portfolio is implemented (e.g., how much is invested in credit strategies) will be the real reason for any difference versus the current policy structure.

## Possible Ranges

- With a simplified number of asset classes, the allocation ranges will need to be re-evaluated.
- Below is a preliminary overview of what such ranges could look like with Mix A and Mix B.
- Where possible (i.e., if there was no change to the asset weight), we kept the ranges the same.
- Ranges marked in ***underlined bold*** represent a change from current allowable ranges.

| Mix A (Simpler) | Target Weights (%) | Preliminary Ranges (%) |
|---|---|---|
| Core Bonds | 13 | 6-20 |
| Mixed Credit | 4 | 0-8 |
| Emerging Market Debt | 4 | 2-6 |
| Private Debt | 7 | 3-11 |
| Global Equity | 35 | 22-50 |
| Equity Options | 7 | 4-10 |
| Private Equity | 9 | 5-13 |
| Real Estate | 9 | 5-13 |
| Infrastructure | 3 | 1-5 |
| PA Hedge funds | 10 | 0-12 |
| GTAA | 8 | 3-11 |

| Mix B (Simplest) | Target Weights (%) | Preliminary Ranges (%) |
|---|---|---|
| Bonds | 25 | ***15-35*** |
| Private Debt | 7 | 3-11 |
| Global Equity | 46 | ***30-60*** |
| Private Equity | 9 | 5-13 |
| Real Assets | 12 | ***6-18*** |
| PA Hedge funds | 10 | 0-12 |

## Possible Ranges (continued)

- A reduction in asset classes *could* result in a reduction of control by the Commission.
- This can be mitigated by setting either targets or target ranges for the underlying strategies or risk factors.
- Strategies/factors that are indented and ***bold*** show possible allowable ranges.

| Mix A (Simpler) | Target Weights (%) | Preliminary Ranges (%) |
|---|---|---|
| Core Bonds | 13 | 6-20 |
| **Inflation linked** | | **0-5** |
| Mixed Credit | 4 | 0-8 |
| Emerging Market Debt | 4 | 2-6 |
| Private Debt | 7 | 3-11 |
| Global Equity[1] | 35 | 22-50 |
| **US** | | ***0.75 – 1.5x*** |
| **Developed Intl** | | ***0.75 – 1.5x*** |
| **EM Equity** | | ***0.5 – 2.0x*** |
| Equity Options | 7 | 4-10 |
| Private Equity | 9 | 5-13 |
| Real Estate | 9 | 5-13 |
| Infrastructure | 3 | 1-5 |
| GTAA | 8 | 3-11 |
| PA Hedge funds | 10 | 0-12 |

| Mix B (Simplest) | Target Weights (%) | Preliminary Ranges (%) |
|---|---|---|
| Bonds | 25 | 15-35 |
| **Non-Investment Grade** | | **0-10** |
| **Non-USD** | | **0-5** |
| **Inflation linked** | | **0-5** |
| Private Debt | 7 | 3-11 |
| Global Equity[1] | 46 | 30-60 |
| **US** | | ***0.75 – 1.5x*** |
| **Developed Intl** | | ***0.75 – 1.5x*** |
| **EM Equity** | | ***0.5 – 2.0x*** |
| **Equity Options** | | **0-10** |
| Private Equity | 9 | 5-13 |
| Real Assets | 12 | 6-18 |
| **Real Estate** | | **5-13** |
| **Infrastructure** | | **0-5** |
| GTAA & Other Opportunistic | | 0-10 |
| PA Hedge funds | 10 | 0-12 |

[1] Ranges for US, Developed International and EM are relative to their weight in the MSCI ACWI IMI index.

# Possible Benchmarks

- Benchmark changes would also need to be discussed and approved
- Benchmarks marked in ***underlined bold*** represent a change from current benchmarks.

| Mix A (Simpler) | Possible Benchmark |
| --- | --- |
| Core Bonds | Bloomberg Barclays Aggregate |
| Mixed Credit | 50% S&P LSTA Leveraged Loan / 50% Barclays US HY |
| Emerging Market Debt | 50% JPM EMBI Global Diversified / 50%JPM GBI-EM Global Diversified |
| Private Debt | S&P LSTA Leveraged Loan + 150 bp (lagged 3-mo) |
| Global Equity | MSCI ACWI IMI |
| Equity Options | 50% CBOE S&P 500 Putwrite/50% CBOE S&P 500 Buywrite |
| Private Equity | 80% R3k / 20% EAFE + 300 bp (lagged 3-mo) |
| Real Estate | NCREIF ODCE Net + 100 bp |
| Infrastructure | DJ Brookfield Global Infrastructure |
| PA Hedge funds | 3-Month T-bills + 250 bp |
| GTAA | Total System Policy Benchmark ex-Private Markets and Portable Alpha |

| Mix B (Simplest) | Possible Benchmark |
| --- | --- |
| Bonds | ***Bloomberg Barclays Universal*** |
| Private Debt | S&P LSTA Leveraged Loan + 150 bp (lagged 3-mo) |
| Global Equity | MSCI ACWI IMI |
| Private Equity | 80% R3k / 20% EAFE + 300 bp (lagged 3-mo) |
| Real Assets | ***NCREIF ODCE Net + 100 bp*** |
| PA Hedge funds | 3-Month T-bills + 250 bp |

## Summary

- It would be very important for the Commissioners and Staff to have clear and identical expectations of how Staff would plan to implement the policy.
- Meketa Investment Group and Staff plan to continue evaluating possible changes.
- We welcome feedback from the Commissioners.

# Appendix A

## Expected Standard Deviation Assumptions

| | Weight | | 2018 Study Volatility Assumptions (%) | 2019 Study Volatility Assumptions (%) | Volatility Difference (%) |
|---|---|---|---|---|---|
| Equities | 18% | U.S. Equity | 18.0 | 17.0 | -1.0 |
| | 11% | Developed Non-U.S. Equity | 20.0 | 19.0 | -1.0 |
| | 6% | Emerging Markets Equity | 25.0 | 24.0 | -1.0 |
| | 7% | Equity Options (Put Write) | 14.0 | 13.0 | -1.0 |
| | 9% | Private Equity | 27.0 | 26.0 | -1.0 |
| Rate Sensitive | 6% | Investment Grade Bonds | 4.0 | 4.0 | 0.0 |
| | 4% | Treasuries (Intermediate) | 3.5 | 3.0 | -0.5 |
| | 1% | Treasuries (Long-term) | 13.0 | 12.0 | -1.0 |
| | 2% | TIPS | 7.5 | 7.0 | -0.5 |
| Credit | 2% | High Yield Bonds | 12.5 | 12.0 | -0.5 |
| | 2% | Bank Loans | 10.0 | 9.0 | -1.0 |
| | 7% | Private Debt | 17.0 | 15.0 | -2.0 |
| | 2% | Emerging Market Debt (local currency) | 14.5 | 14.0 | -0.5 |
| | 2% | Emerging Market Debt (USD) | 11.5 | 11.0 | -0.5 |

## Expected Standard Deviation Assumptions (continued)

| | Weight | | 2018 Study Volatility Assumptions (%) | 2019 Study Volatility Assumptions (%) | Volatility Difference (%) |
|---|---|---|---|---|---|
| Real Assets | 5% | Core Private Real Estate | 12.0 | 11.0 | -1.0 |
| | 3% | Value-Add Private Real Estate | 19.0 | 18.0 | -1.0 |
| | 1% | Public Real Estate (REITs) | 28.5 | 26.0 | -2.5 |
| | 1% | Core Private Infrastructure | 15.0 | 14.0 | -1.0 |
| | 1% | Non-Core Private Infrastructure | 23.0 | 22.0 | -1.0 |
| | 1% | Public Infrastructure | 18.0 | 17.0 | -1.0 |
| Opportunistic | 7% | Global Tactical Asset Allocation | 12.5 | 10.0 | -2.5 |
| | 10% | Portable Alpha Hedge Funds | 8.5 | 7.0 | -1.5 |
| | 1% | Risk Parity | 11.0 | 10.0 | -1.0 |