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Mr. Rob Feckner
Chair of the Investment Committee
California Public Employees' Retirement System
400 P Street
Sacramento, CA 95814

Re: Consultant Review of Global Equity Program

Dear Mr. Feckner:

Wilshire has conducted its annual review of the CalPERS Global Equity (GE) Program. In addition to implementing and managing the PERF's global equity allocation, the GE Program encompasses management of the Affiliate Investment Programs (AIP). Our review included a series of onsite meetings and recurring conference calls with key members of the global equity investment team. The due diligence onsite agenda covered a variety of critical functional areas and processes including:

- GE Structure and Governance Model
- Research (idea generation and agenda governance)
- Portfolio Construction
- Corporate Governance
- Affiliate Investment Programs

Overview

The Global Equity Program's mandate is to efficiently deliver low cost global equity beta to the PERF, which provides the Fund strategic exposure to global growth and the equity risk premium. Despite underperforming its custom benchmark in recent years (Exhibit 1

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on page 3), primarily due to its intentional and sustained tilt towards defensive positioning, the GE Program continues to meet its overall portfolio objective noted above. Staff manages the portfolio within a narrow risk budget (i.e. tracking error) and, consistent with initiatives across the PERF, is critically reassessing all excess return sources for their individual efficacy and overall value to the total fund.

Affiliate Investment Programs

While the remaining sections of this letter focus on the GE Program's role within the PERF, our review included coverage of the Affiliate Investment Programs (AIP), which collectively represent aggregate assets of approximately $18.6 billion. As noted above, the AIP functionally operates within Global Equity even though the investment programs include global equities, fixed income and real assets. The largest asset pools include the California Employers' Retiree Benefit Trust ($9.8 billion), the Public Employees' Long-Term Care Fund ($4.8 billion) and the Judges' Retirement System II Fund ($1.7 billion). AIP responsibilities also include the supervision of two Supplemental Income Plans (SIP) within a defined contribution platform with $1.7 billion in participant assets.

Major initiatives for the AIP team during the 2018-2019 fiscal year focused on implementation of the revised asset allocation targets approved in Q2 2018 and preparation for the launch and funding of the newly established California Employers' Pension Prefunding Trust (CEPPT). In a joint project with the Trust Level Portfolio Management (TLPM) team, asset allocation recommendations for the CEPPT were developed and brought to the Board for approval at the June 2019 Investment Committee meeting.

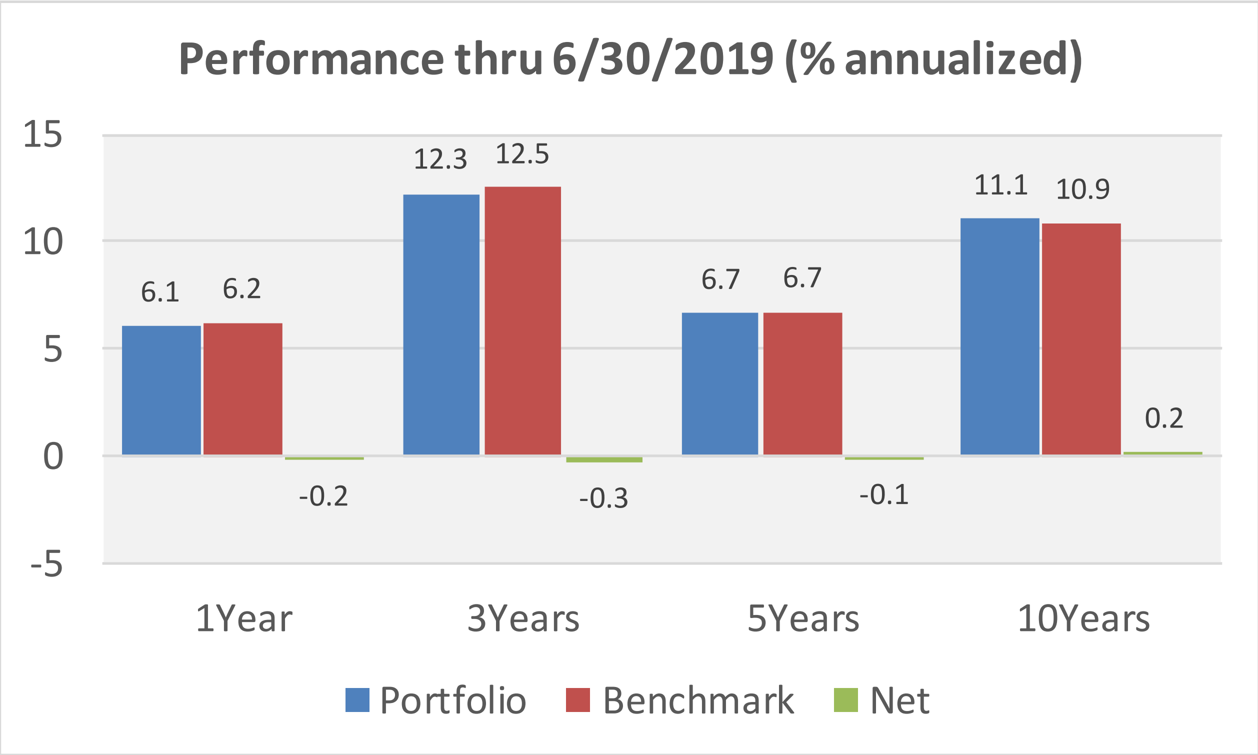
In addition to supporting funding of the CEPPT, the AIP team has several other key initiatives planned for the 2019-2020 fiscal year. These include research into the potential inclusion of private equity within the Judges II fund, a move towards Global Investment Performance Standards (GIPS) compliance for the CERBT, CEPPT and SIP funds, and continued technology enhancements to the Artemis allocation and transitions platform.

Global Equity Portfolio Objectives and Performance

The GE team's mandate is to deliver the global equity market beta (as represented by CalPERS' custom benchmark), plus a modest excess return target with a risk budget of up to 50 bps of tracking error annually. The GE portfolio underwent significant change during the 2018-2019 fiscal year as it transitioned to the segmented equity structure approved by the Investment Committee (IC) during the latest asset liability cycle. In total, 30% of the portfolio (representing approximately $55B) was transitioned from the capitalization-weighted segment to the newly introduced factor-weighted segment. This massive shift in assets was prudently spread throughout the fiscal year and benefited from strong collaboration across the investment office (INVO) and centralized coordination from the Trust Level Portfolio Management (TLPM) team.

As can be seen in Exhibit 1 below, the GE portfolio trailed its benchmark by -0.2% in the 2018-2019 fiscal year and by an annualized -0.3% and -0.1% over the latest three and five fiscal year periods, respectively. Over the past ten years, the GE portfolio has delivered a positive 0.2% excess return versus its benchmark. The portfolio has also contributed very strong absolute returns over the ten-year period (11.1% annualized), which coincides with the end of the global financial crisis (GFC).

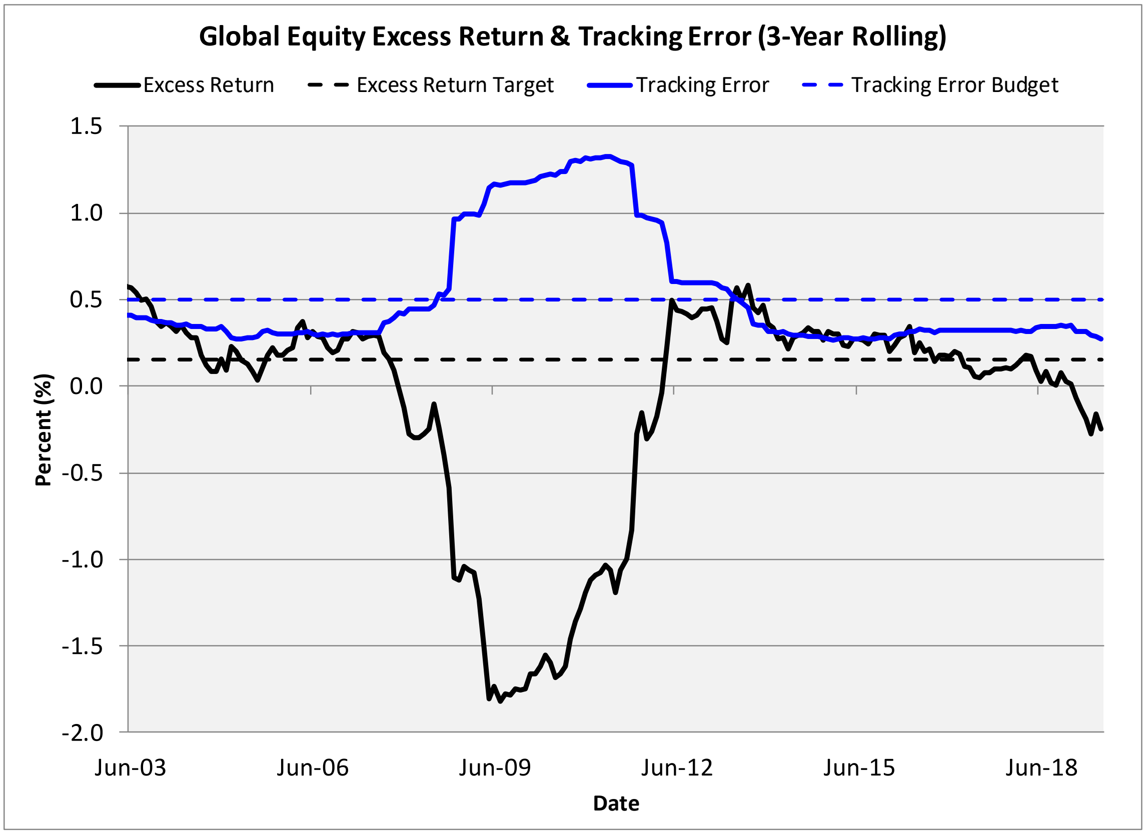
Exhibit 1



Note that, due to rounding, “Net” figures are not uniformly consistent with the differences in displayed “Portfolio” and “Benchmark” returns.

The three-year rolling realized excess return and tracking error figures provided in Exhibit 2 demonstrate that, following several years of very strong relative performance, realized returns have recently trended below the 15-bps excess return target into negative territory (solid black line vs. dotted black line). The Program continues to stay well within its allocated risk budget over reasonable rolling periods (solid blue line vs. dotted blue line).

Exhibit 2



Strategy Allocation and Portfolio Structuring

Consistent with the GE Program's tracking error mandate of 0 to 50 bps, more than 75% of assets under management (AUM) are managed as index-oriented strategies (top table in Exhibit 3). The assets within this low active-risk component of the portfolio increased by over 15% in conjunction with the factor weighted segment transition noted above (bottom table in Exhibit 3). Looking outside of the Index Oriented strategies, the remaining ~23% of the GE portfolio is allocated to traditional active (~14%, down nearly 6% from a year earlier), alternative beta (~8%, down over 7% from last year) and activist strategies (<1%), with varying levels of tracking error. The 0% allocation to emerging managers noted in Exhibit 3 reflects this segment's structural shift into the TLPM program. Nearly 90% of the portfolio is managed internally, which, when including transfer of the Emerging Managers account, represents an almost 8% increase from a year earlier. The bottom table within Exhibit 3 shows the changes in strategy allocations over the most recent fiscal year. A noteworthy statistic that reflects the GE program's continued move towards efficiency and strategy justification is the meaningful reduction in the number of strategy accounts from 46 to 28. A significant contributor to this reduction of 18 accounts was the shift from regional implementation of several factor-tilted strategies to a more holistic global approach to factor harvesting.

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Exhibit 3: Strategy Allocation

As of June 2019

Managed	Index Oriented	Active: Traditional	Active: Alt Beta	Active: Activist	Active: Emerging Managers	Total
Internally	77.2%	2.5%	8.3%	0.0%	0.0%	88.0%
Externally	0.0%	11.7%	0.0%	0.3%	0.0%	12.0%
Total	77.2%	14.2%	8.3%	0.3%	0.0%	100.0%

June 2019 vs. June 2018

Managed	Index Oriented	Active: Traditional	Active: Alt Beta	Active: Activist	Active: Emerging Managers	Total
Internally	15.0%	-0.2%	-7.1%	0.0%	0.0%	7.7%
Externally	0.0%	-5.6%	0.0%	0.0%	-2.1%	-7.7%
Total	15.0%	-5.8%	-7.1%	0.0%	-2.1%	0.0%

The remainder of this report provides Wilshire perspectives, scoring, and rationale on the Global Equity Program.

Evaluation Scoring

Wilshire continues to rate the GE Program highly, ranking the overall Program in the third tier (i.e. decile) among other similar asset management operations. Significant positives include quality of investment team, commitment to improvement and strong risk budgeting controls within the portfolio construction process, while the lack of equity ownership is a detractor versus peers in the asset management industry.

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CalPERS Global Equity		Tier	Letter
Total Qualitative Score		3rd	B
	Weight	**Tier**	**Letter**
Organization	**20%**	**4th**	**B**
FIRM	*50%*	6th	C
Quality and Stability of Senior Management			
Quality of Organization			
Ownership/Incentives			
TEAM	*50%*	3rd	B
Stability of Investment Professionals			
Quality of Team			
Commitment to Improvement			
Information Gathering	**20%**	**2nd**	**A**
Information Resources			
Depth of Information			
Breadth of Information			
Forecasting	**20%**	**4th**	**B**
Clear & Intuitive Forecasting Approach			
Repeatable Process			
Strength, Clarity, and Intuitiveness of Valuation Methodology			
Forecasting Success			
Unique Forecasting Approach			
Portfolio Construction	**20%**	**1st**	**A**
Risk Budgeting/Control			
Defined Buy/Sell Discipline			
Consistency of Portfolio Characteristics			
Implementation	**10%**	**3rd**	**B**
Resources			
Liquidity			
Compliance/Trading/Monitoring			
Attribution	**10%**	**1st**	**A**
Depth of Attribution			
Integration of Attribution			

Tiers are based on a decile distribution with 1st Tier representing the highest score and 10th Tier the lowest score.

	Rating									
Decile	1	2	3	4	5	6	7	8	9	10
Corresponding Grade	A		B		C		D		F	

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Organization: Firm (Score Increased: Filled CIO Position)

In evaluating the quality of an asset manager's organization, Wilshire assesses factors contributing to the stability of the organization and the alignment of incentives between the team and the organization's long-term objectives. This year's score reflects the recent hiring of the new Chief Investment Officer (CIO) (positive), as well as the abrupt departure of the short-tenured Chief Operating Investment Officer (COIO) (negative). As evidence of CalPERS' strong senior leadership team, the COIO position has been assumed on an interim basis by the MID of Global Equity, limiting the departure's potential disruption on INVO operations. We believe that the new CIO has brought a fresh perspective to improving fund performance and have seen early evidence of his commitment to continuing to break down asset class silos to focus on Total Fund performance.

As we have noted in the past, CalPERS faces some unique organizational risks that for-profit enterprises have greater flexibility in managing, such as the inability to provide employees direct and indirect ownership opportunities. These long-term forms of incentives are common within private sector investment organizations and can serve as significant retention tools. The absence of such compensation structures can expose the organization to the increased risk of losing intellectual capital at both the Investment Office (INVO) Senior Staff level and the senior management level within Global Equity to asset managers and other financial institutions. Ensuring that CalPERS continues to have the tools necessary to recruit and retain qualified, diverse candidates should be a strong focus in line with Investment Belief #10 - Resources and Process. In addition, given that there are some changes that are taking place across the organization according to the new initiatives of the CIO, the impact from potential changes in the structure of the investment teams and their resulting compensation contributes some uncertainty. We do note that the organization has made strides to adjust pay scales to be more competitive in the marketplace, as well as aligning incentive compensation with Total Fund performance objectives.

Organization: Team (Score Unchanged)

Global Equity's broad team structure has been consistent and has benefited from increased team stability during recent years. Turnover is mitigated through a positive and intellectually challenging work environment, deliberate active involvement of all GE team members in the investment process and a strong sense of mission. Global Equity's team-based culture ensures that each person, including the MID, has multiple potential back-ups, which assists in mitigating key person risk. This redundancy in function was put to the test in fiscal 2018-2019 as the MID of Global Equity assumed the recently vacated COIO position on an interim basis. Organizational flexibility of this type is extremely valuable to the Investment Office and, in this most recent case, was specifically made possible by the strength, quality and experience of Investment Director and Investment Officer- level staff within Global Equity.

Global Equity utilizes a committee structure to serve as its primary deliberative body. The key objective of this committee - the Global Equity Capital Allocation Committee (GECAC) - and its various sub-committees is to provide a robust governance structure and an open setting for the critical evaluation of ideas and in making holistic investment decisions across the GE portfolio. The GECAC acts on recommendations put forth by its subcommittees or project teams working at the direction of the MID of Global Equity. The GECAC's sub-committees include the Portfolio Positioning, Portfolio Opportunities and Portfolio Structuring & Execution Subcommittees. Importantly, the GECAC's membership is functionally diverse and includes colleagues from other INVO programs, which allows it to efficiently act on decisions made at the Total Plan level (e.g. Investment Committee, CIO, Investment Strategy Group).

The GE program includes a fully integrated Corporate Governance team, which directly manages proxy voting, corporate engagement and shareholder campaigns. This embedded structure has allowed GE to internalize some previously contracted third-party services. For example, as of June 2019, the Corporate Governance team filed 93 majority vote proposals at companies that failed to respond constructively to multiple attempts to engage on improving corporate board diversity. Of those filings, 56 companies settled and five proposals passed of the sixteen that went to vote. The GE Corporate Governance team further collaborates with the Sustainable Investment (SI) program via the proxy voting, research, financial markets and correspondence working groups, which report into the Governance and Sustainability Subcommittee (GSS) that is chaired by the MID of Sustainable Investment. Corporate Governance and SI also formally collaborate during proxy season through weekly proxy season 'heat map' meetings, where they collectively assess sensitive votes. The groups also coordinate climate-related research and engagement through the formation of a Climate Action 100+ engagements working group.

<u>Information (Score Unchanged) & Forecasting (Score Reduced: Forecasting Results/Success)</u>

CalPERS' Global Equity Program manages a variety of active and index-oriented strategies. Few of the index-oriented strategies follow pure index-replication principles, but rather are enhanced by active decisions presented by market events such as corporate actions, rebalancing/trading views and other pricing anomalies. Global Equity also implements traditional active strategies that focus on factor positioning and alternative beta, (i.e. momentum, value, size and quality factors), and identification of external managers with unique sources of expected alpha (skill) for use in the portfolio. GE's approach of internally implementing strategies whose underlying intellectual capital has been licensed from investment management firms and other strategic partners is a cost-effective way to employ these quantitative strategies without paying additional fees for implementation, while capitalizing on the skills of the Global Equity investment team. Wilshire views Global Equity's ability to select from a variety of different alpha generating strategies and implementation approaches as an important competitive edge relative to other organizations, though this year's slightly reduced Forecasting score reflects the recent underperformance discussed earlier. While the reduction in score is not meant to flag any areas of significant concern, benchmark-relative results are an important metric from which to assess forecasting skill.

The strategy development and search functions focus on providing Global Equity with new internally and externally managed strategies to broaden the available opportunity set. The primary focus of strategy development has been on researching “smart beta,” “alternative beta” and other factor-weighted approaches. GE’s strategy search process is very focused and provides a streamlined approach to obtain information from external managers. Existing strategies, both externally and internally managed, are continuously evaluated to determine if they individually and collectively can be expected to add value to the Program on a long-term basis. The annual review process provides a more formal assessment whereby a potentially negative outcome would lead to an in-depth evaluation to determine if a strategy termination recommendation is warranted.

Global Equity has access to external ESG quantitative and qualitative data from both MSCI and Sustainalytics for each portfolio and their underlying investments. Use of these platforms provides Global Equity with information on over 8,000 global companies including company profiles, thematic and sector reports and controversies.

GE’s manager selection process formally includes an ESG scoring component, which requires managers to articulate how they integrate ESG considerations into their investment process. Staff’s ESG scoring model directly contributes to a strategy’s final ranking in determining its portfolio selection. Portfolios are measured on each of the three components of E, S and G.

<u>Portfolio Construction (Score Unchanged)</u>

The Global Equity program’s portfolio construction approach balances managing costs and pursuing structured risks with positive expected payoffs. These priorities are consistent with Investment Belief #7 – Risk vs. Reward. The process has a strong focus on portfolio construction through its allocation to strategies approved within the GE Capital Allocation Committee (GECAC) and its sub-committee structure, as well as monitoring risk factors of the overall GE portfolio and its individual underlying allocations. Global Equity has access to portfolio analysis and attribution tools, which contribute to an Executive Dashboard that facilitates the effective monitoring of portfolio risk characteristics. This analytics package highlights active tilts and contributions to risk from individual factors and can be customized to focus on key drivers of risk and return.

Staff’s attention to risk is very apparent and very rigorous in all levels of decision making and is designed to prevent attachment to any single strategy or firm. This translates into a top-decile score for risk budgeting and control for Global Equity. The GECAC’s access to a rich set of risk reports enables adherence to desired risk levels and position sizing. The process is designed to minimize the impact of unintended exposures. As such, strategy and overall portfolio tracking errors are reviewed at least monthly to ensure that

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risk is being deployed in areas with positive expected payoffs. This process aligns well with Investment Belief #5 – Accountability as the relative performance comparisons of the individual components of the broader portfolio and decisions regarding changes in that portfolio can be measured versus an appropriate benchmark.

The risk reporting process for Global Equity regularly evolves and provides a meaningful feedback loop at the factor, strategy, manager and total portfolio levels. The reports are utilized throughout the due diligence and research process, allowing Staff to leverage the reports' informational value throughout the Global Equity program. The team's continued expansion of its risk reporting package and commitment to building on these capabilities is impressive and is industry-leading versus other asset owners and even many asset management organizations.

Global Equity staff identifies ESG risks found in individual portfolios and uses the information to initiate discussions with its partners to better understand the potential risk/reward pay-off and the justification for holding highlighted securities. Global Equity's external partners are expected to evaluate and respond accordingly to the impact of ESG risks and opportunities in an identified investment or portfolio. Wilshire views this as a sound process for monitoring and managing ESG risks across individual strategies and the aggregate portfolio

Consistent with CalPERS' approved program of divestments, Global Equity excludes some markets and industries including Tobacco, EM principles, Iran, Sudan, Firearms and Thermal coal.

<u>Implementation (Score Reduced: Less liquidity within Factor-weighted Segment)</u>

The GE Program's trading operations are performed through the centralized Execution Services & Strategy (ESS) function. The ESS platform was designed to reduce operational risk by centralizing transactions between both Global Fixed Income and Global Equity. As a component of the Opportunistic Strategies (OS) Program, Wilshire's formal review of ESS is contained within our recent OS Program review (August 2019 IC agenda). However, as it relates to GE, it is important to monitor the evolution and resourcing of the ESS platform for its ability to continue to serve the needs of the team. For example, while Wilshire remains very supportive of INVO's decision to centralize the ESS function, the loss of GE management control over trading functions (i.e. with ESS's move from GE to OS at the end of fiscal 2016-2017), presents some Program vulnerability to manage GE priorities against those of other INVO programs. This year's slight reduction in the Implementation score reflects the lower level of liquidity within the newly established Factor-Weighted segment of the GE portfolio. Staff has recognized these issues and is currently engaged in implementing a research project to mitigate a portion of the Factor-Weighted segments liquidity limitations. Upon successful completion of that project, Wilshire would expect to see an increase in next year's Implementation score.

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Attribution (Score Unchanged)

Global Equity benefits from robust attribution capabilities that provide actionable information related to the drivers of portfolio risk and return. The Executive Dashboard (noted earlier) and various risk reports provide the team with a rich set of information, including return and risk attribution at the total portfolio level as well as insights that assist the team in identifying intentional vs unintentional risk positioning at both the factor (i.e. region/country/sector/style) and security level. In addition to the overall Global Equity portfolio, monitoring sheets have been developed for external mandates that summarize key information obtained from different internal and external data management and risk management systems. Insights gleaned from these reports can be used to facilitate valuable discussions with external managers. Staff has access to more detailed reports should the summary reports highlight specific issues with a manager. Stress tests are applied to assess the potential impact from various changes in the market environment. For example, active risks and their underlying factor contributions can be evaluated to ensure that they are still in line with expectations and continue to properly reflect intended portfolio positioning.

Conclusion

Wilshire's overall qualitative evaluation rating of 3rd Tier reflects the GE Program's many strengths. Global Equity is supported by a team and resources that are united in the common goal of streamlining the global investment portfolio by reducing the number of strategies and pursuing a fee philosophy that is aligned with CalPERS' Investment Beliefs. The focus on efficiency and strategy justification reflects an awareness of the risk/reward relationship, the multi-faceted nature of risk and the impact of costs on the ultimate performance of the PERF. The strategic goals of the Global Equity program also recognize the long-term horizon of the investment portfolio and a responsibility to manage the portfolio to achieve the PERF's investment objectives and ensure sustainability.

Please do not hesitate to contact us should you require anything further or have any questions.

Sincerely,