Wilshire

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August 31, 2019

Mr. Rob Feckner
Chairman of the Investment Committee
California Public Employees' Retirement System
400 P Street, Suite 3492
Sacramento, CA 95814

Re: Global Fixed Income Annual Review

Dear Mr. Feckner:

Wilshire conducted an on-site review of the internal fixed income team's personnel, investment process, and resources. The CalPERS Global Fixed Income (GFI) Program is designed to diversify equity risk for the total fund and provide current income and liquidity. The Program is actively managed with 96% of the $106.3 billion in assets managed internally by staff, and the remaining 4% outsourced to external managers.

The review process included discussions with senior staff members of each fixed income segment within the GFI Program. Review topics included Program investment process, personnel and resource management, as well as investment and risk management procedures.

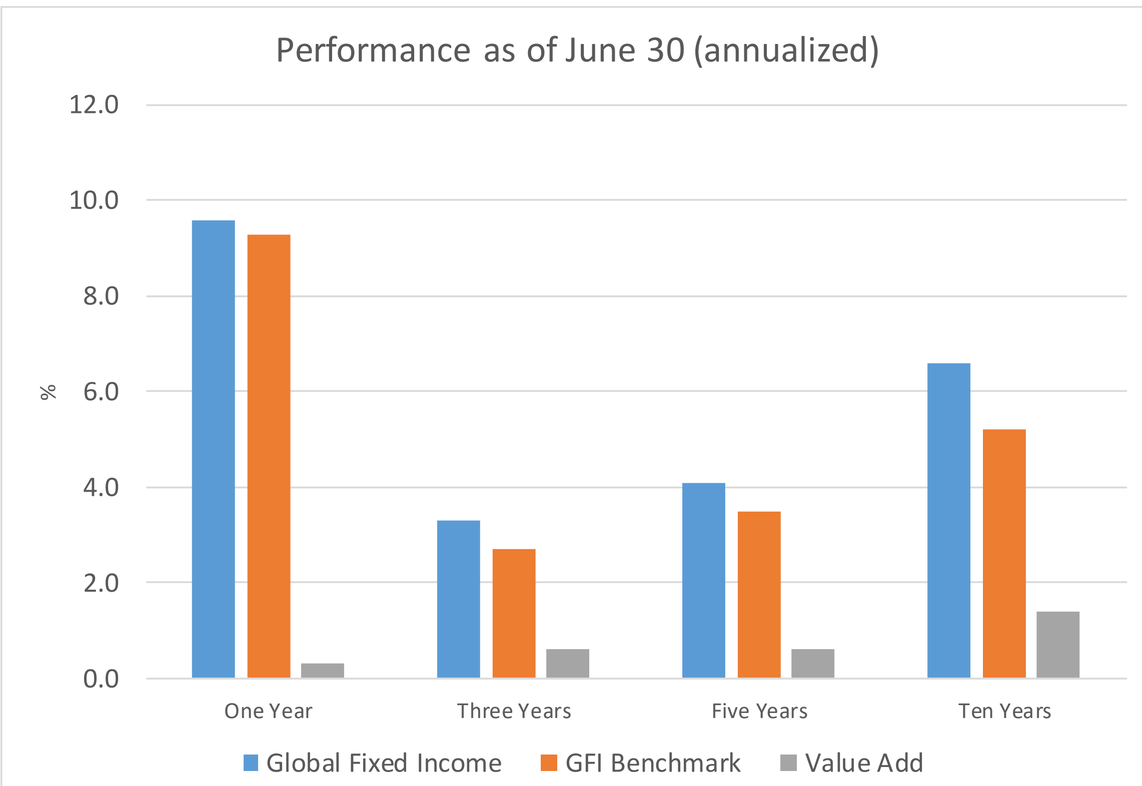
<u>Summary</u>

Last year's review reflected an elevated level of uncertainty over leadership within GFI, which has abated to an extent in this update. In 2019, Arnie Phillips was appointed MID – Global Fixed Income after serving as the interim MID, and following a long tenor as the ID-Structured Securities. Wilshire views this internal promotion in a very positive light. **We believe the Global Fixed Income Program is managed in an effective and risk-conscious manner, leveraging the deep expertise of the senior management team.**

Fiscal year 2019 marked an important period of transition in how GFI is constructed following the last ALM cycle. Specifically, GFI has been broken down into three component segments: 1) Treasuries, 2) Spread sectors, and 3) High Yield. The roles and characteristics of each segment are sufficiently distinct that separating them during the asset allocation optimization process allowed for more efficient portfolio construction. Treasuries offer very high levels of liquidity and have offered solid protection against equity drawdowns, but experience direct sensitivity to interest rate changes. High yield bonds behave more like equities in bear markets but offer a significant pickup in yield versus other instruments and some diversification in more typical markets. Spread sectors represent the bulk of the portfolio and balance interest rate sensitivity with higher quality credit risk. This granularity allows for a higher level of flexibility in the asset allocation process to help achieve CalPERS' investment objectives.

Exhibit One shows the Program's historical performance relative to its benchmark, and Exhibit Two shows the stability of the GFI return profile in comparison to that of the Global Equity Program over time.

Exhibit One



The CalPERS GFI program has generated positive value-add across all periods, and has added 30 bps over the benchmark for the most recent one-year period. In sharp contrast to the discussion last year, the Program benefited substantially from its duration exposure during FY 2019. In fact, the last fiscal year presents a good case study on the value of continuing to utilize fixed income in a total portfolio context, providing meaningful ballast when equity risk markets sold off sharply in 4th quarter of 2018. In addition, the dramatic shift down in the level of interest rates through the end of fiscal year 2019 and continuing in the current fiscal year has been a tailwind for absolute performance of the fixed income portfolio.

The underlying active strategies in the fixed income portfolio (Structured Securities, Credit, Sovereign, International) broadly outperformed over one, three, and five years. The number of active strategies is under review and Staff noted the importance of reevaluating the efficacy of active opportunities with a rigorous process. This has resulted in the curtailment or elimination of strategies that are not expected to help achieve the stated objectives for GFI. Staff will focus deployment of active risk in those areas where they have demonstrated the ability to add value. Wilshire views this risk conscious approach positively.

The 12-month rolling returns shown in Exhibit Two, as well as the 3-year rolling correlations with the Global Equity Program shown in Exhibit Three, demonstrate the role the GFI portfolio plays in diversifying equity returns over different market cycles throughout the past 20 years.

Exhibit Two

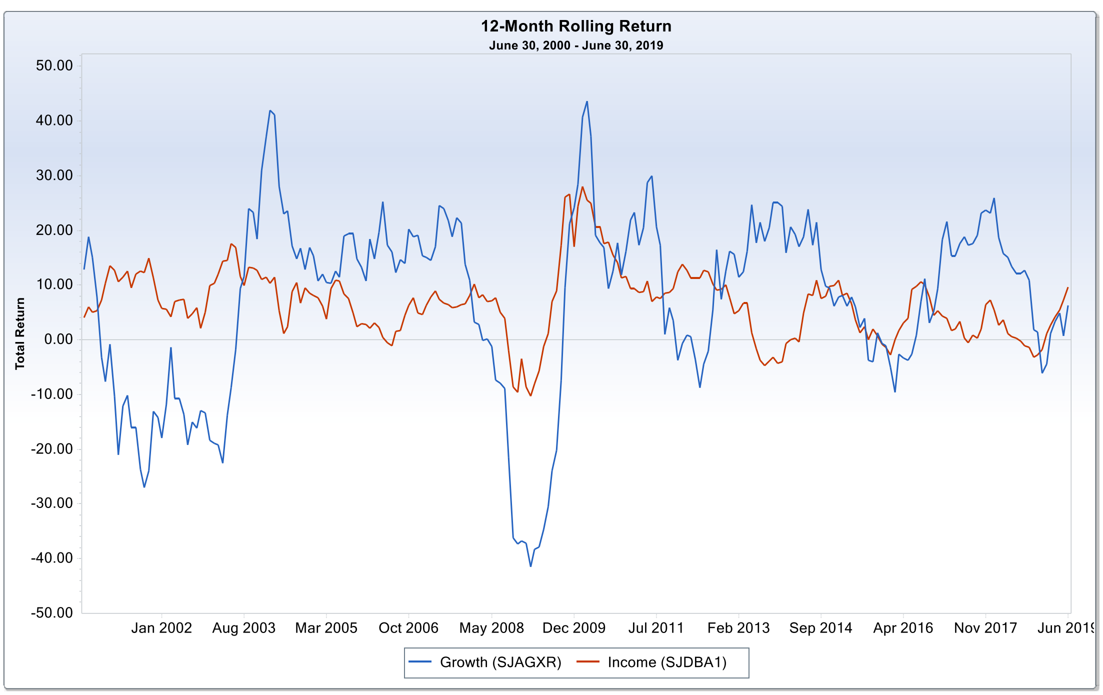
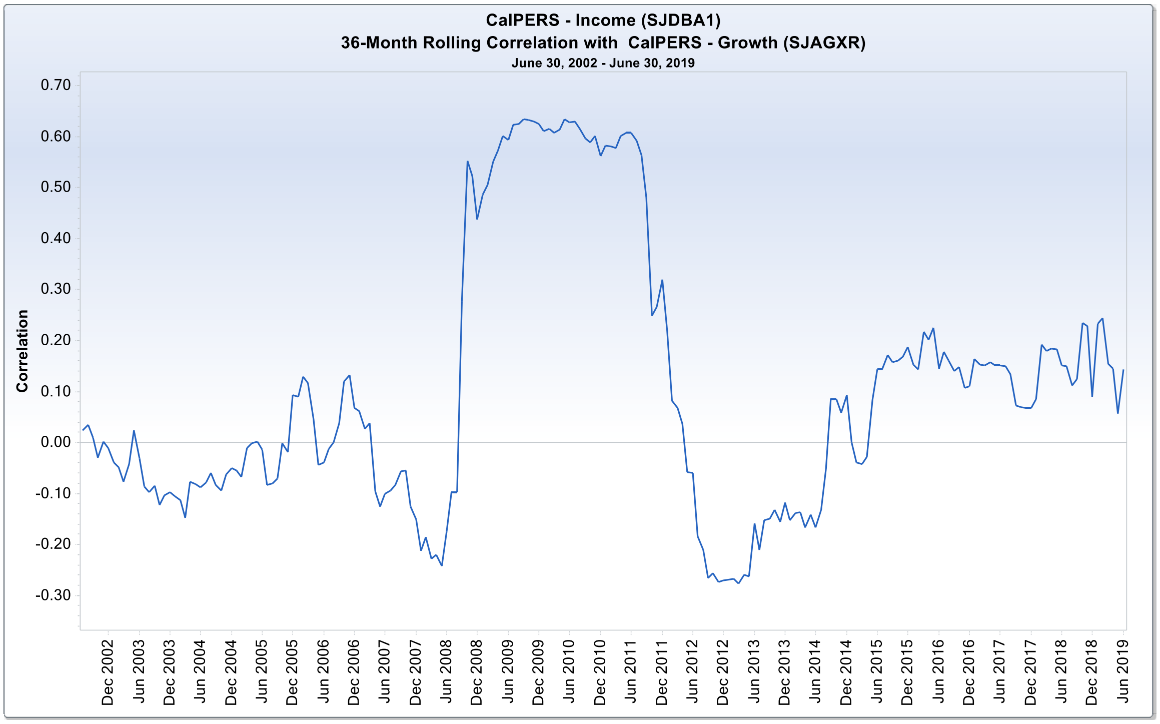


Exhibit Three



The investment approach of the total GFI program remains consistent with its key strategic objective of providing income, stability, and equity risk diversification within the Total Fund. At the same time, GFI has outperformed its benchmark consistently through both sub-sector relative value decisions and tactical positioning. GFI portfolios have taken advantage of alpha generating opportunities in different markets, while maintaining relatively prudent risk positioning over time.

The remainder of this report provides more detail on Wilshire's rationale in evaluating the Global Fixed Income Program.

Scoring

Wilshire continues to rate the GFI Program highly, ranking the overall Program in the 3rd decile relative to other asset managers. While the overall score is the same as last year, it does reflect a positive impact from the clarity around Program leadership, tempered by Wilshire's desire to observe how the team will develop given the new segmentation structure. The Programs' ability to gather, process and implement portfolio strategies are significant positives, as is the high quality and experience of the senior management team. Lack of equity ownership and competitive compensation remain a detractor to the overall score, as do recruiting challenges and the concomitant time it takes to fill open positions. Moderate score increases were also included for Implementation and Attribution given the success of the asset allocation implementation and transparency on the drivers of active performance.

CalPERS Global Fixed Income	Tier	Letter
Total Qualitative Score	3rd	B

	Weight	Tier	Letter
Organization	20%	5th	C
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%	1st	A
Information Resources			
Depth of Information			
Breadth of Information			
Forecasting	20%	2nd	A
Clear & Intuitive Forecasting Approach			
Repeatable Process			
Strength, Clarity, and Intuitiveness of Valuation Methodology			
Forecasting Success			
Unique Forecasting Approach			
Portfolio Construction	20%	2nd	A
Risk Budgeting/Control			
Defined Buy/Sell Discipline			
Consistency of Portfolio Characteristics			
Implementation	10%	2nd	A
Resources			
Liquidity			
Compliance/Trading/Monitoring			
Attribution	10%	2nd	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	

Discussion

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 Equities, limiting the departures 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 Fixed Income 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)

The Global Fixed Income MID position was permanently filled with the appointment of the acting interim head. Wilshire views this positively in two critical ways. First, the internal promotion indicates that the investment organization is adept at attracting, cultivating, and retaining talent at the highest level. Second, the internal promotion supports continuity of an investment process that has produced outstanding results over a long period and through multiple market cycles.

The presence of senior staff members with deep investment expertise, as well as the management skills developed within the CalPERS' culture is a strong plus in maintaining stability of the investment program with the new permanent MID and the new CIO. The experience level of the senior fixed income staff (AIM's and above) is exceptionally high with an average of over 20 years' experience, while the ID's and MID average over 30 years' experience. This provides a level of assurance that the successful implementation of the global fixed income program will continue.

The sub-sectors are divided based on the systematic nature of fixed income risk, such as credit (corporate), structured products (mortgage-backed, asset-backed, etc.), and interest rates (Treasuries). Staff in charge of the strategies are highly knowledgeable and manage their respective sectors of the portfolio against appropriate benchmarks. There are also a number of external managers who provide direct investment management and act as strategic partners to provide research and insight, supplementing the work performed by Staff.

A potential increase in turnover does remain a concern given new organizational initiatives, and Wilshire would like to monitor this before increasing the component Team score. Turnover in the mid to junior level staff can be exacerbated by a relatively structured career path and promotion system. Staff is clearly cognizant of this issue and has structured the team with layers of expertise for coverage of critical investment functions, though this can be improved, and recruiting is ongoing for open positions. Recruiting efforts have been focused on attracting a more diverse pool of candidates to fill open positions, particularly at the senior level, which Wilshire views positively and believes further broadens the pool of top tier talent for consideration. A mitigating factor is the availability of internal opportunities within other INVO groups for those looking to make a transition within the CalPERS organization, and the AIM position remains a positive in the effort to retain senior talent.

Total Fund level initiatives continue to be an area of cross-division cooperation and commitment. In fact, resources previously dedicated to GFI are being redirected to contribute to a centralized research group for the Total Fund. While this is a positive for cooperation at the Total Fund level, it does detract somewhat from GFI resources. Senior GFI staff members continue to contribute a meaningful amount of time to various sub-committees designed to find ways to improve Total Fund performance. Staff's participation in these cross-functional initiatives provides important insights and is a reflection of their dedication to the success of the plan. This additional demand on the staff's time reinforces the need for efficient resource management, particularly with respect to recruiting and retaining talent for the organization.

Information Gathering (Score Decreased: Reduction in Dedicated Resources)

The GFI team has lost a few dedicated resources with the creation of a centralized research group and elimination of a dedicated Inflation portfolio. This resulted in a moderate decrease in our scoring. Staff continues to leverage a network of managers and financial institutions, as well as the internal economic research team to gather the necessary information relevant to the GFI portfolios. The sector specialists covering the sub-sectors - Treasuries, structured securities, and corporate bonds – leverage the research and quantitative analyses generated both internally and externally to formulate investment strategies. These strategies are shared in regular meetings, along with the macro outlook impacting the overall financial markets. Given the secular appreciation of the equity market and concerns over valuation levels in the market, the GFI portfolio has been opportunistic in finding alpha opportunities within the low yield market, and a shifting volatility profile.

On environmental, social and governance (ESG) related initiatives, the GFI team integrates relevant indicators to better identify and manage ESG related risks in internal credit portfolios. Staff holds quarterly ESG reviews of the portfolio and provided numerous examples of investment actions that incorporated ESG factors in the analysis around risk and return. Staff is also continuing its work to measure the carbon footprint of the internal credit portfolio relative to the benchmark, as well as monitoring the green bond space for opportunities. The team has updated the high yield manager guidelines to incorporate ESG factors into the investment process, as well as contributing to analysis of projects around water scarcity and the impacts of technological disruption.

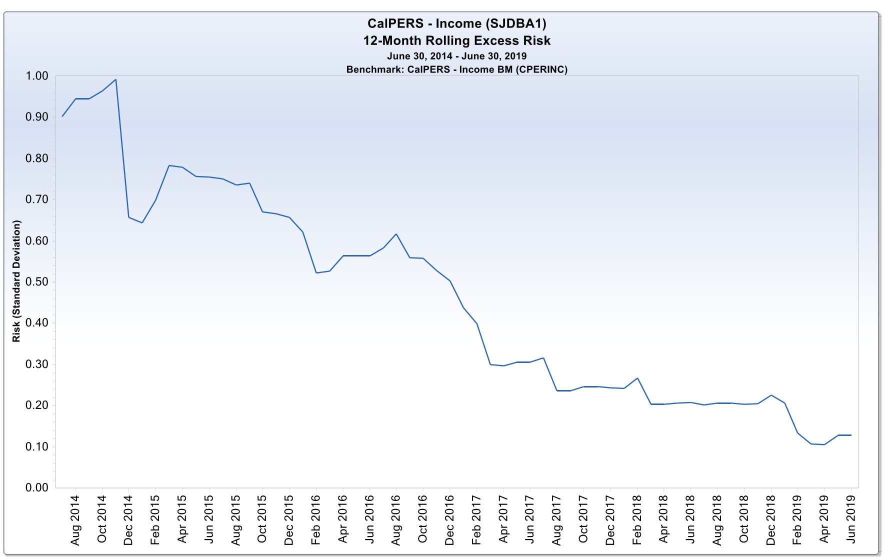
Forecasting (Score Unchanged)

The GFI portfolio has consistently demonstrated a level of forecasting success as evidenced by the positive relative returns for the portfolio as a whole. The team continues to incorporate significant macroeconomic and market analysis, along with judicious awareness of the current extended credit cycle. The key themes developed through the qualitative and quantitative analyses discussed in the Information section are shared in weekly strategy and research meetings. Enhanced staffing focused on quantitative analysis is expected to contribute to a more systematic approach in managing risks and finding relative value opportunities within segments.

GFI's positive relative returns were widespread with almost all the underlying strategies posting above benchmark returns. The lone exception was the external high yield portfolios, although those have been a strong contributor over longer-term periods. Over the past year, duration has been managed relatively conservatively, which reflects a shift away from material top down deviations versus the index, and is consistent with the positioning over the last few years. As such, the portfolio has a higher quality bias and minimal directional exposure with respect to interest rates and judicious credit spread active risk. Investment grade corporate bonds were a significant contributor to performance during the fiscal year on both an absolute and relative basis, while non-investment grade bonds posted moderately weaker returns (though still positive). Mortgage-backed structured products contributed moderately to active performance over the last fiscal year. As the interest rate environment evolves over time, the liquid nature of these securities will allow them to be utilized as an additional duration management tool, while providing some yield pickup compared to Treasuries.

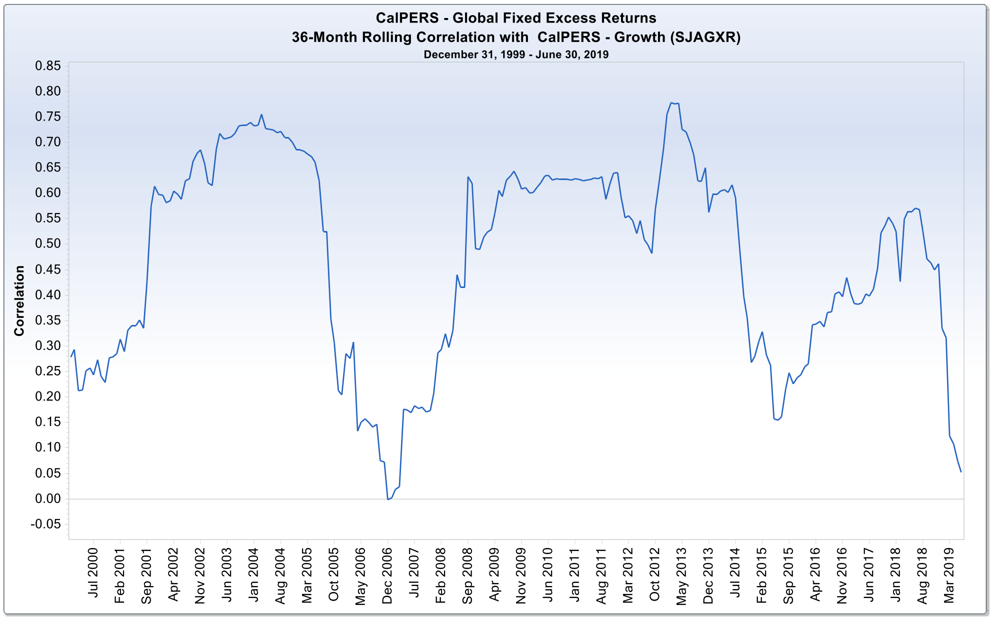
<u>Portfolio Construction (Score Unchanged)</u>
The change in MID has resulted in a shift in the way the aggregate fixed income portfolio is managed, which is likely to be solidified with the permanent appointment. The current team is taking a more collaborative approach to portfolio construction with input provided by sector ID's in their areas of expertise. Previously, the sub-sector IDs determined the positioning of the respective strategies within their respective guidelines, while the MID adjusted aggregate exposures. The senior team is striving to utilize the same data and consistent frameworks to come to consensus. The GFI portfolio focuses on reflecting the relative value opportunities across sub-sectors *within* each segment, taking into account liquidity and market capacity considerations.

The segmentation present in the asset allocation process reduces the likelihood of significant over and underweights across segments, particularly Treasuries versus other segments. The team will avoid frequent tilts with lower levels of expected active return, and only take those positions given extremely compelling opportunities. While this could positively affect performance and risk management, there exists the potential for slower decision-making and is likely to result in a more moderate active risk profile. This is a continuation of a trend of reducing active risk for the total GFI program as shown in the chart below.



Each sub-sector ID continues to monitor the risks relative to the appropriate index, within the guidelines of the Fixed Income Policy and Investment Procedures & Guidelines and with respect to credit spread, interest rate and portfolio concentration risks.

The allocations to interest rate risk and credit risk contribute to the diversification provided by the GFI portfolio versus global equity market performance. As spread products such as corporate bonds (investment grade and high yield alike) are driven by the credit worthiness of the issuer, the return drivers of these segments are more highly correlated to the equity markets in comparison to government issued bonds and, to a lesser extent, structured products. The following chart does indicate a positive correlation between GFI excess returns and the CalPERS Growth portfolio over time. The shift to a segmented fixed income portfolio is likely to reduce the correlation to growth, in line with the more recent history.



With respect to liquidity management, the portfolio segmentation ensures a high level of liquidity given the dedicated Treasury allocation. Staff had previously consolidated the management of all short-term investment funds, which has increased the efficiency of the portfolio, as well as added value through streamlining the management process across asset classes. Additionally, GFI staff have been very active in discussions regarding leverage management across the Total Fund.

Overall, the portfolio construction approach is very well aligned with Investment Beliefs #1 – Liabilities, #2 – Long-Term Horizon, and #7 – Risk vs. Reward. The portfolio construction score did not change this year, as Wilshire would like to observe how, or if, the active risk positioning shifts.

Implementation (Score Increased: Successful Asset Allocation Transition) and Attribution (Score Increased: Enhanced Transparency)

The GFI Programs utilize third-party portfolio management and trading platforms, and are evaluating additional platforms to improve efficiency across different fixed income instruments. The team has enhanced transparency across the GFI portfolio and improved internal reporting and attribution. They are well aware of the re-investment requirement for improving system capabilities and supplementing them when necessary with outside input and expertise. The enhancement of internal systems continues to be a focus for certain team members and ensures that new capabilities keep pace with the additional workload being undertaken by the internal team, a process which Wilshire fully supports.

Trading of Treasuries, sovereigns, and currency has been centralized with the ESS team in the Opportunistic Strategies Program, with both Global Equities and GFI trades being handled on the same order management system. The GFI team and the ESS team have been working closely over the past year to consolidate the trading process to reduce operational risk and increase efficiency of execution, though the GFI team continues to handle trading for structured products and corporates. Wilshire recognizes that synergistic opportunities can be harvested when the execution teams have the expertise and market knowledge of the instruments being traded. Wilshire is also supportive of the continuing evaluation of further cross-asset class coordination possibilities.

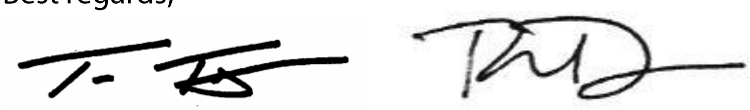
Operational and compliance risk is also present in the internal fixed income portfolio, as it would be for any external manager. CalPERS has both enterprise and investment compliance teams, as well as a risk management group, and they are collectively tasked with monitoring portfolios risks across asset classes. Given the size and complexity of the CalPERS portfolio, ensuring that the risk management group remains adequately staffed is important.

Conclusion

We believe that Staff has demonstrated the ability to both effectively and efficiently manage CalPERS' fixed income portfolios. The investment philosophy is appropriate for CalPERS' needs and provides both cash yield and diversification benefits to the Total Fund. There are sufficient investment risk controls in place to mitigate many of the risks of managing fixed income portfolios. The main challenges are largely related to organizational-level issues, such as a lack of long-term retention incentives. **Utilizing our standard manager research scoring framework, Wilshire's qualitative assessment of the Program places it in the 3rd decile. While this is the same overall score as last year, it does reflect some shift in the underlying metrics as detailed above. The score continues to reflect the strong team in place and clear success at managing the portfolio as charged.**

Should you require anything further or have any questions, please do not hesitate to contact us.

Best regards,



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