Memo

To:	**Nebraska Investment Council**
From:	David Rose Sarah Gal
Date:	October 3, 2017
Re:	Core Real Estate Portfolio Construction Optimization

Comments & Recommendation:

The NIC Real Estate program was launched in 2006 and since its inception has pursued a balanced approach to real estate investing. The balanced approach has meant targeting at least 50% (and up to 80%) of the portfolio to Core real estate which provides diversification from fixed income and equities, a solid source of income, and the potential inflation hedge. The balance of the program (20% - 50% target) is free to pursue non-Core investing as a return enhancer. As of Q2 2017, the Core allocation represents nearly 72% of the total real estate program and includes allocations to three funds on the equity side from the following sponsors: UBS, Prudential, and Barings.

AHIC research suggests that achieving material consistent alpha in private Core real estate over the widely used index (NCREIF NFI-ODCE) is quite difficult, requiring significantly more active movement or trading in and out of funds within the index which is prohibitive for most institutional investors. AHIC believes that efforts in manager selection pursuing alpha within the real estate program are better spent reviewing opportunities in the Non-Core segment, which has shown to be effective for NIC's portfolio. While there is no index fund for investors in Core real estate at this time, investors can construct portfolios that minimize tracking error against the NFI-ODCE with relative ease. In the balance of the memo are exhibits from AHIC research illustrating the case for an "index" like approach in Core US real estate.

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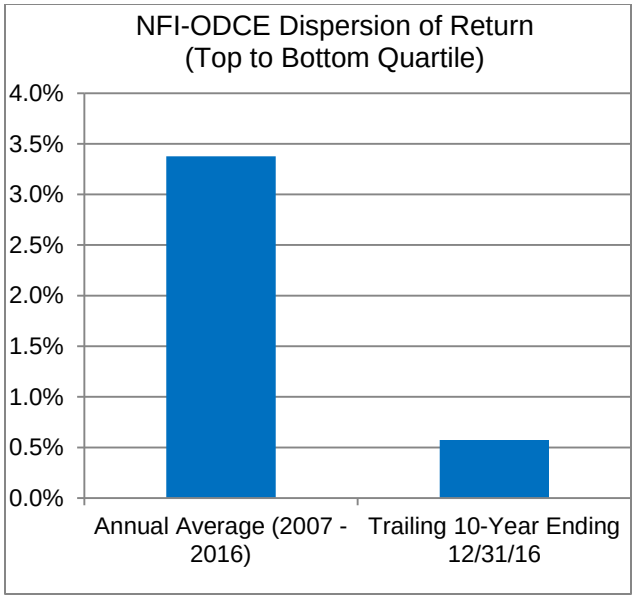
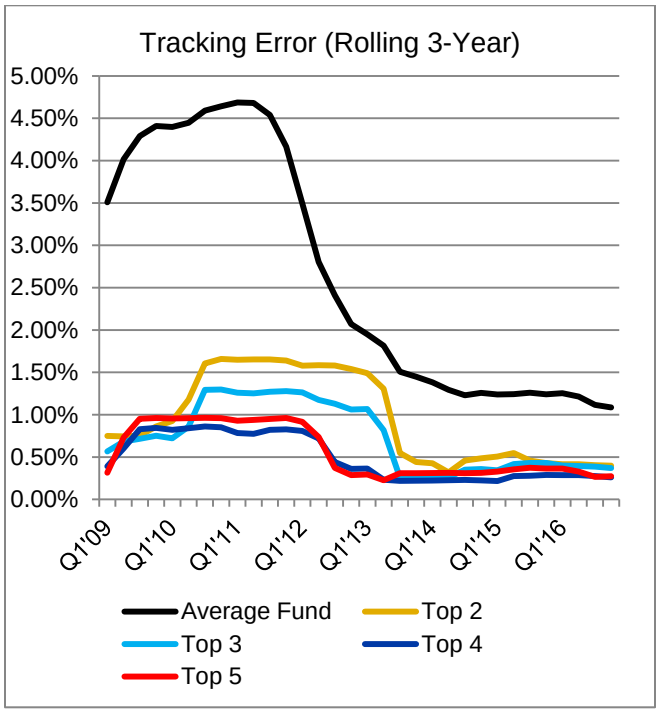
Exhibit 1: Dispersion of Returns within NFI-ODCE



The NFI-ODCE Index (NCREIF Fund Index – Open End Diversified Core Equity) is a time weighted return index made up of US domiciled Core equity funds. The Index is utilized by investors, advisors and other market participants to measure the performance for stabilized real estate in the US and is widely recognized as the best approximation of private market real estate beta for institutional investors.

As of Q4 2016, there were 24 active funds contributing data to the index, 16 of which had at least a 10 year history. Exhibit 1 shows the average annual dispersion of top to bottom quartile fund performance over each calendar year for the 10 year period from 2007 to 2016 along with the top to bottom quartile performance dispersion of annualized performance for the 10-year period ending in Q4 2016. While short term annual dispersion is nearly 350 basis points, the dispersion over a longer 10-year period shrinks to just over 50 basis points. This analysis suggests that while there is a material difference between strong and weak performers, over the long-term there is not much to be gained by investors trying to pick outperformers among NFI-ODCE funds. Given that these are private market funds with quarterly entry and exit availability, subject to queues, it can be quite difficult to “time the market” through active trading of funds, most market participants in these funds are long-term investors.

Exhibit 2: Tracking Error for NCREIF NFI-ODCE Funds and Sample Portfolios



If an investor accepts that material long term outperformance against the NFI-ODCE isn't likely, the next question to answer is how many funds are needed to minimize short term tracking error against the NFI-ODCE to best capture the index returns over short time periods while minimizing risk of underperformance.

For the same 16 funds that have a 10-year performance history we calculated tracking error over rolling 3-year periods, taking the average experience of those funds to illustrate what an investor can expect by investing in one fund over a short-to-medium term measurement period. The black line in Exhibit 2 shows that rolling three-year tracking error in more normalized return environments, post global financial crisis, runs at about 1.25%.

Investors who create a proportional weighted portfolio of at least the largest two funds in the NFI-ODCE can reduce short term tracking error against the benchmark by over 0.75% compared to the experience of the average fund from the sample of 16. In normalized return environments, marginal improvements to tracking error can be had by moving to a largest three, four, or five fund portfolio; however, the biggest difference is felt by moving from a single fund to at least two.

Summary:

Applying the optimization approach to NIC, we note that the DB/CBB portfolio has already benefited from having a diversified portfolio. Note in Exhibit 3 on the next page that the NIC Core portfolio has a tracking error materially lower than an approach of just going with a single fund. The DB/CBB portfolio currently has exposure to three funds, including two of the top three in UBS-TPF and Prudential PRISA.

Exhibit 3: Tracking Error for NIC DB Core Portfolio and Sample "Top 3" Portfolio