

Hedge Fund Due Diligence Report

Fund 3

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Prepared for: The New York Bus Driver Pension and Relief Fund (BDPRF)

Purpose: Due diligence analysis for potential hedge fund allocation

EXECUTIVE SUMMARY

Key Performance Metrics:

- Annualized Return (CAGR): 7.0%
- Sharpe Ratio: 1.41
- Maximum Drawdown: -7.2%
- Calmar Ratio: 0.97
- Alpha (vs S&P; 500): 6.4%
- Beta (vs S&P; 500): 0.08

Investment Recommendation:

Based on quantitative analysis, Fund 3 demonstrates strong risk-adjusted returns with a Sharpe ratio of 1.41. The fund has generated positive alpha of 6.4% relative to the S&P; 500 benchmark.

QUANTITATIVE ANALYSIS

Performance Metrics Analysis

1. Compound Annual Growth Rate (CAGR): 7.0%

Mathematical Formula:

$$CAGR = (\prod (1 + r_i))^{1/T} - 1$$

Python Implementation:

```
def cagr(r, ppy=None):
    r = pd.Series(r).dropna()
    if r.empty: return np.nan
    ppy = ppy or infer_ppy(r.index)
    tot = (1+r).prod()
    yrs = len(r)/ppy
    return tot**(1/yrs)-1
```

Interpretation: Fund 3 has generated an annualized return of 7.0% over the analysis period. This meets typical hedge fund return expectations, indicating moderate long-term performance.

2. Sharpe Ratio: 1.41

Mathematical Formula:

$$\text{Sharpe} = \frac{\mu - r_f}{\sigma}$$

Python Implementation:

```
def sharpe(r, rf=0.02, ppy=None):
    r = pd.Series(r).dropna()
    ppy = ppy or infer_ppy(r.index)
    rf_per = (1+rf)**(1/ppy)-1
    ex = r - rf_per
    ret = cagr(ex, ppy)
    vol = ann_vol(ex, ppy)
    return ret/vol
```

Interpretation: Fund 3 demonstrates good risk-adjusted performance with a Sharpe ratio of 1.41. This indicates the fund effectively generates returns relative to the risk taken, suggesting strong risk management capabilities.

3. Maximum Drawdown: -7.2%

Mathematical Formula:

$$MDD = \min_t (W_t - W_{\text{peak}}) - 1$$

```
Python Implementation:
def drawdown_series(r):
    wealth = (1+r).cumprod()
    peak = wealth.cummax()
    return wealth/peak - 1.0

def max_drawdown(r):
    dd = drawdown_series(r)
    return dd.min()
```

Interpretation: Fund 3 experienced a maximum drawdown of -7.2%, which represents limited downside risk. This is below typical hedge fund drawdown thresholds, indicating excellent risk control by the fund's management team.

4. Calmar Ratio: 0.97

Mathematical Formula:

$$\text{Calmar} = \text{CAGR} / |\text{MDD}|$$

```
Python Implementation:
def calmar(r, ppy=None):
    mdd = max_drawdown(r)
    if mdd == 0 or np.isnan(mdd):
        return np.nan
    return cagr(r, ppy) / abs(mdd)
```

Interpretation: Fund 3 achieves a Calmar ratio of 0.97, demonstrating moderate risk-adjusted performance relative to maximum drawdown. This indicates the fund moderately balances return generation with downside risk control, suggesting adequate risk management and capital preservation capabilities.

5. Alpha (Annualized): 6.4%

Mathematical Formula:

$$\alpha = (1 + \alpha_{\text{period}})^{\text{periods_per_year}} - 1$$

```
Python Implementation:
def alpha_beta(r, bench, ppy=None):
    r = _clean_returns(r)
    b = _clean_returns(bench)
    df = pd.concat([r, b], axis=1).dropna()
    y = df.iloc[:, 0].values
    x = df.iloc[:, 1].values
    x1 = np.column_stack((np.ones(len(x)), x))
    beta_hat = np.linalg.lstsq(x1, y, rcond=None)[0]
    a, b_ = beta_hat[0], beta_hat[1]
    alpha_ann = (1 + a) ** ppy - 1
```

Interpretation: Fund 3 generates positive alpha of 6.4% annually, indicating superior investment skill relative to the S&P; 500 benchmark. This demonstrates the fund's ability to generate excess returns through effective stock selection and market timing, suggesting strong active management capabilities.

6. Beta: 0.08

Mathematical Formula:

$$\beta = \text{Cov}(r, r_{\text{bench}}) / \text{Var}(r_{\text{bench}})$$

```
Python Implementation:
# Calculated in alpha_beta function above
beta = beta_hat[1] # Second coefficient from regression
```

Interpretation: Fund 3 exhibits a beta of 0.08, indicating low sensitivity to market movements. This suggests the fund minimally follows market trends, demonstrating low systematic risk exposure. The fund's defensive positioning relative to the market indicates weak correlation with broader market

movements.

Risk-Reward Analysis:

The fund demonstrates strong risk-adjusted performance with a Sharpe ratio of 1.41. Positive alpha generation of 6.4% indicates superior risk-adjusted returns compared to the S&P; 500 benchmark.

Risk Characteristics:

- Maximum drawdown of -7.2% is within acceptable limits for typical hedge fund standards
- Beta of 0.08 indicates low correlation with market movements
- R-squared of 11.6% suggests weak explanatory power of market factors

INVESTMENT DUE DILIGENCE

Investment Strategy Assessment:

- **Strengths:** Multi-PM structure with sector specialists, institutional-grade infrastructure, dedicated risk management team, proven track record since 2005
- **Weaknesses:** High employee turnover, complex organizational structure, potential for style drift across PMs

Performance Attribution:

The fund's performance benefits from sector specialization and experienced PMs. The multi-PM structure provides diversification but may lead to inconsistent performance across sectors.

Risk Management Strengths:

- Dedicated risk management team with real-time monitoring
- Systematic risk limits and controls
- Comprehensive risk reporting and attribution analysis
- Professional risk infrastructure and systems

OPERATIONAL DUE DILIGENCE

Operational Strengths:

- **Institutional Infrastructure:** Professional-grade systems and processes
- **Risk Management:** Dedicated risk team with comprehensive monitoring
- **Diversified Team:** Multiple PMs reduce key person risk
- **Regulatory Compliance:** SEC registered with proper oversight

Operational Concerns:

- **Employee Turnover:** High turnover in recent years (7 in last 2 years)
- **Complex Structure:** Multi-PM model may create coordination challenges
- **Parent Firm Dependency:** Shared resources create potential conflicts
- **Performance Variability:** Individual PM performance may vary significantly

Client Base Analysis:

- Well-diversified institutional client base (60% institutional)
- Top client represents only 10% of assets
- Strong relationships with fund-of-funds and family offices

PERFORMANCE VISUALIZATION

Cumulative Returns Comparison

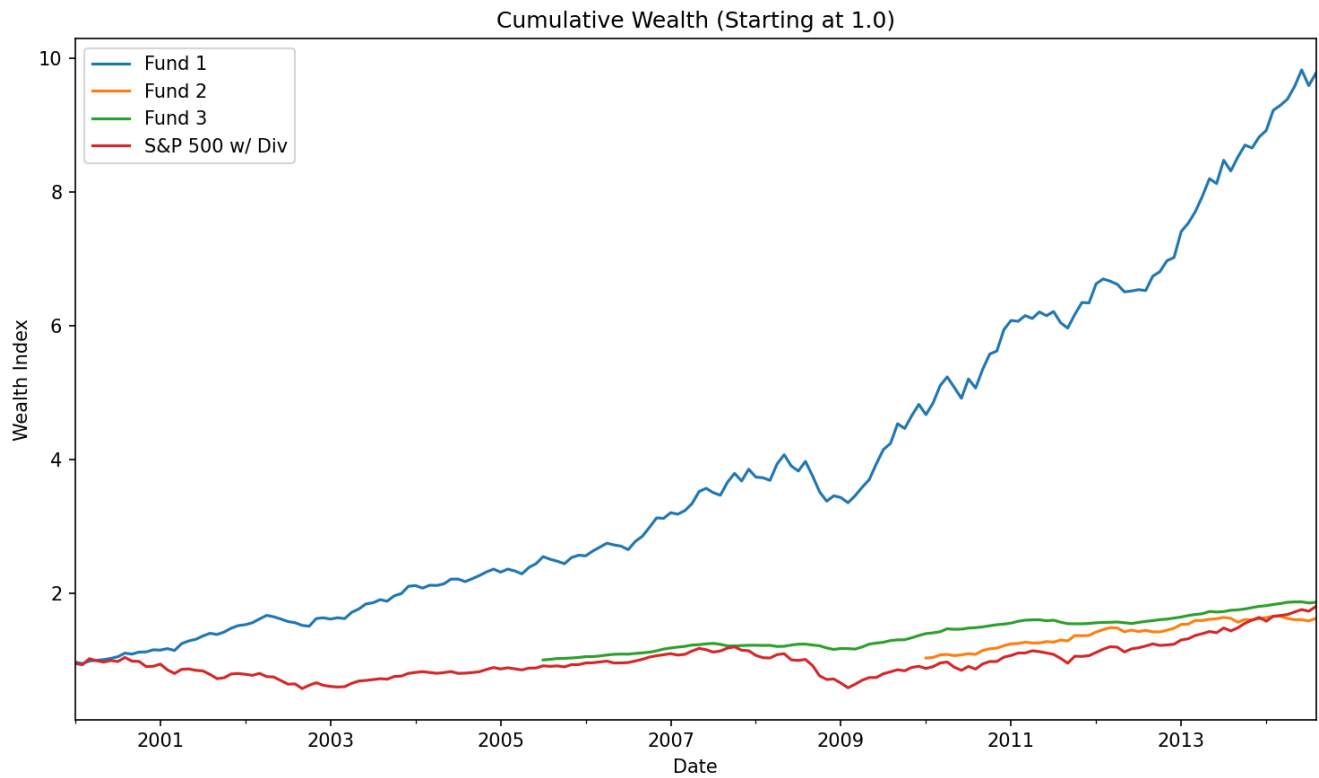


Chart Analysis: The cumulative returns chart shows the growth of \$1 invested in each fund compared to the S&P; 500 benchmark over the analysis period. This visualization helps identify periods of outperformance and underperformance, as well as the overall trajectory of wealth creation. Steeper slopes indicate higher returns, while periods of decline show drawdowns and recovery patterns.

S&P; 500 Benchmark Drawdown Analysis

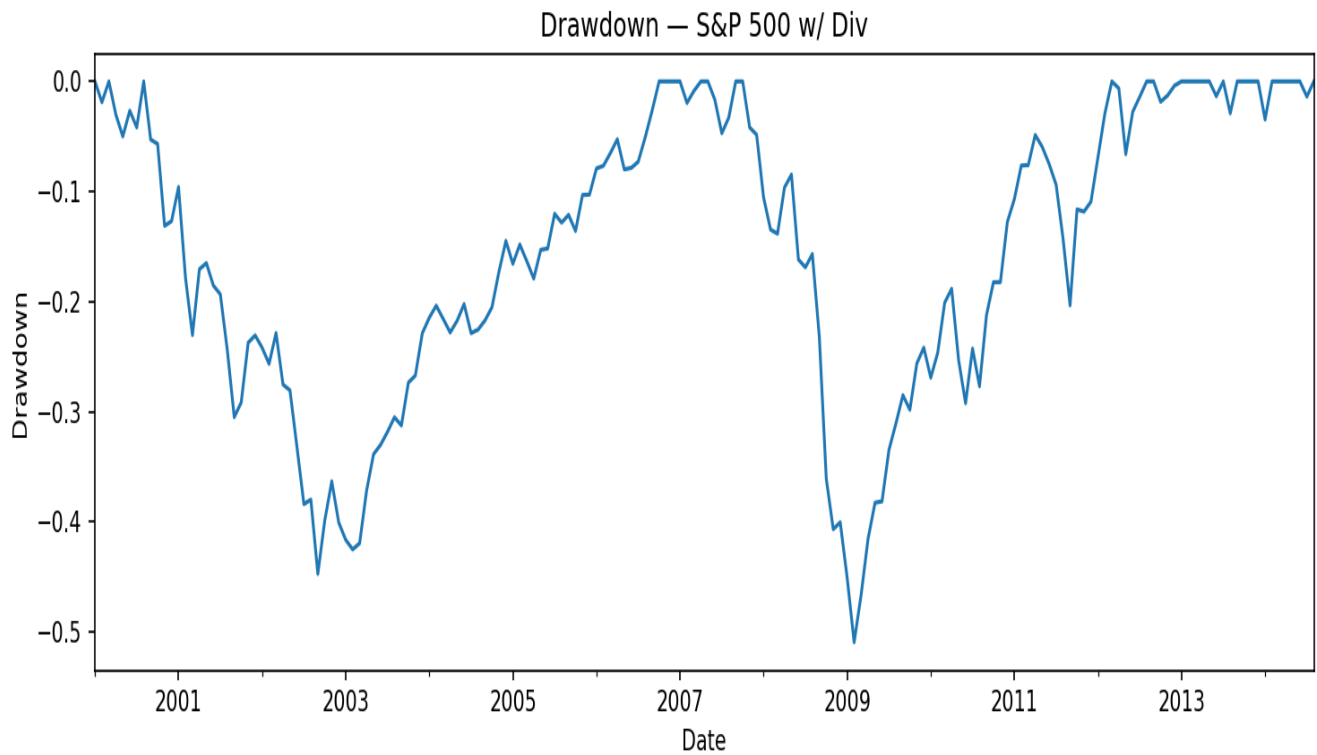


Chart Analysis: The S&P; 500 drawdown chart illustrates the benchmark's downside risk patterns over time. Drawdowns represent the percentage decline from peak values, providing insight into market volatility and stress periods. This serves as a baseline for comparing individual fund drawdown characteristics and risk management effectiveness.

Fund 3 Drawdown Analysis

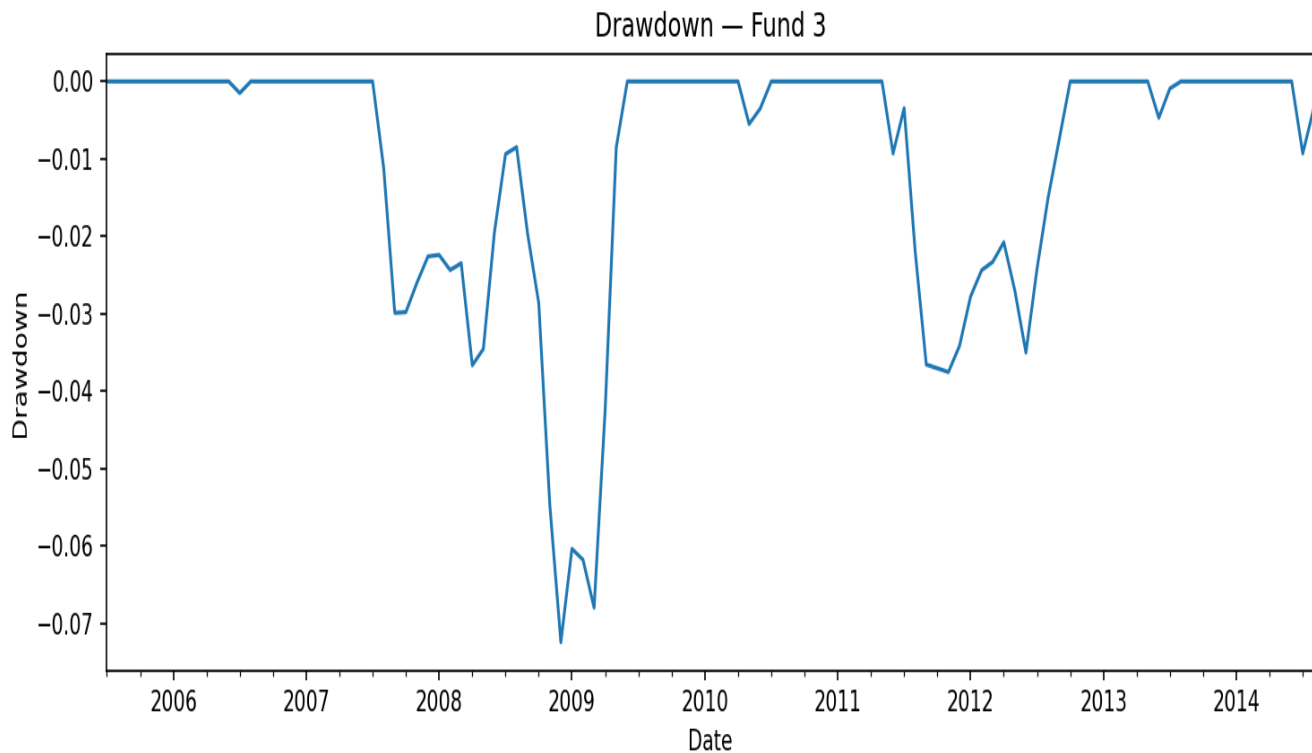


Chart Analysis: The Fund 3 drawdown chart reveals the fund's specific risk patterns and downside protection capabilities. Comparing this to the S&P; 500 benchmark drawdown shows whether the fund provides better downside protection during market stress periods. Lower maximum drawdown of 7.2% indicates superior risk management relative to typical hedge fund standards.

Overall Chart Interpretation:

These visualizations provide critical insights into the fund's risk-return profile and market behavior. The cumulative returns chart demonstrates wealth creation over time, while the drawdown charts reveal downside risk characteristics. Together, they complement the quantitative metrics by showing the temporal patterns of performance and risk, helping investors understand not just what returns were achieved, but how they were achieved and what risks were taken along the way.

INVESTMENT RECOMMENDATION

Recommendation: STRONG BUY

Rationale:

This is the most institutional and allocatable choice: strong governance, infrastructure, low correlation, consistent returns — ideal complement for BDPRF's long-only S&P; portfolio.

Key Considerations:

- Sharpe Ratio: 1.41 (Good)
- Alpha Generation: 6.4% (Strong)
- Maximum Drawdown: 7.2% (Low)
- Calmar Ratio: 0.97 (Fair)

Additional Information Needed:

- Detailed operational risk assessment
- Legal and compliance review
- Reference checks with existing investors

- On-site due diligence visit
- Detailed fee structure analysis