

Hedge Fund Due Diligence Report

Fund 1

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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): 16.8%
- Sharpe Ratio: 1.54
- Maximum Drawdown: -17.6%
- Calmar Ratio: 0.95
- Alpha (vs S&P; 500): 14.7%
- Beta (vs S&P; 500): 0.44

Investment Recommendation:

Based on quantitative analysis, Fund 1 demonstrates strong risk-adjusted returns with a Sharpe ratio of 1.54. The fund has generated positive alpha of 14.7% relative to the S&P; 500 benchmark.

QUANTITATIVE ANALYSIS

Performance Metrics Analysis

1. Compound Annual Growth Rate (CAGR): 16.8%

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 1 has generated an annualized return of 16.8% over the analysis period. This exceeds typical hedge fund return expectations, indicating strong long-term performance.

2. Sharpe Ratio: 1.54

Mathematical Formula:

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

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 1 demonstrates excellent risk-adjusted performance with a Sharpe ratio of 1.54. This indicates the fund effectively generates returns relative to the risk taken, suggesting strong risk management capabilities.

3. Maximum Drawdown: -17.6%

Mathematical Formula:

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

```
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 1 experienced a maximum drawdown of -17.6%, which represents moderate downside risk. This exceeds typical hedge fund drawdown thresholds, indicating concerning risk control by the fund's management team.

4. Calmar Ratio: 0.95

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 1 achieves a Calmar ratio of 0.95, 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): 14.7%

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 1 generates positive alpha of 14.7% 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: 0.44

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 1 exhibits a beta of 0.44, 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 1.54. Positive alpha generation of 14.7% indicates superior risk-adjusted returns compared to the S&P; 500 benchmark.

Risk Characteristics:

- Maximum drawdown of -17.6% exceeds typical hedge fund standards
- Beta of 0.44 indicates low correlation with market movements
- R-squared of 50.4% suggests strong explanatory power of market factors

INVESTMENT DUE DILIGENCE

Investment Strategy Assessment:

- **Strengths:** Long-term fundamental value approach, experienced PM with 20+ years experience, low turnover strategy with 24-36 month holding periods, focus on small to mid-cap opportunities
- **Weaknesses:** Single PM dependency, limited diversification (8-10 positions), high concentration risk, no systematic risk management

Performance Attribution:

The fund's performance is driven by stock selection rather than market timing. The fundamental research approach has generated consistent alpha through deep company analysis and long-term value creation.

Risk Management Concerns:

- No dedicated risk manager - PM assumes dual role
- Soft stop-loss at -50% may be too lenient
- High position concentration (10% per position)
- Limited hedging capabilities (ETFs/indices only)

OPERATIONAL DUE DILIGENCE

Operational Strengths:

- Simple organizational structure with clear segregation of duties
- Reputable service providers (prime broker, administrator, legal)
- Experienced team with long tenure
- No regulatory issues or compliance concerns

Operational Concerns:

- **Key Person Risk:** Heavy reliance on single PM for all investment decisions
- **Succession Planning:** No clear succession plan for PM role
- **Infrastructure:** Outsourced IT and legal functions may create dependencies
- **Scalability:** Limited team size may constrain growth

Client Base Analysis:

- High concentration in fund-of-funds (50% of AUM)
- Top client represents 38.89% of fund assets
- Limited institutional diversification

PERFORMANCE VISUALIZATION

Cumulative Returns Comparison

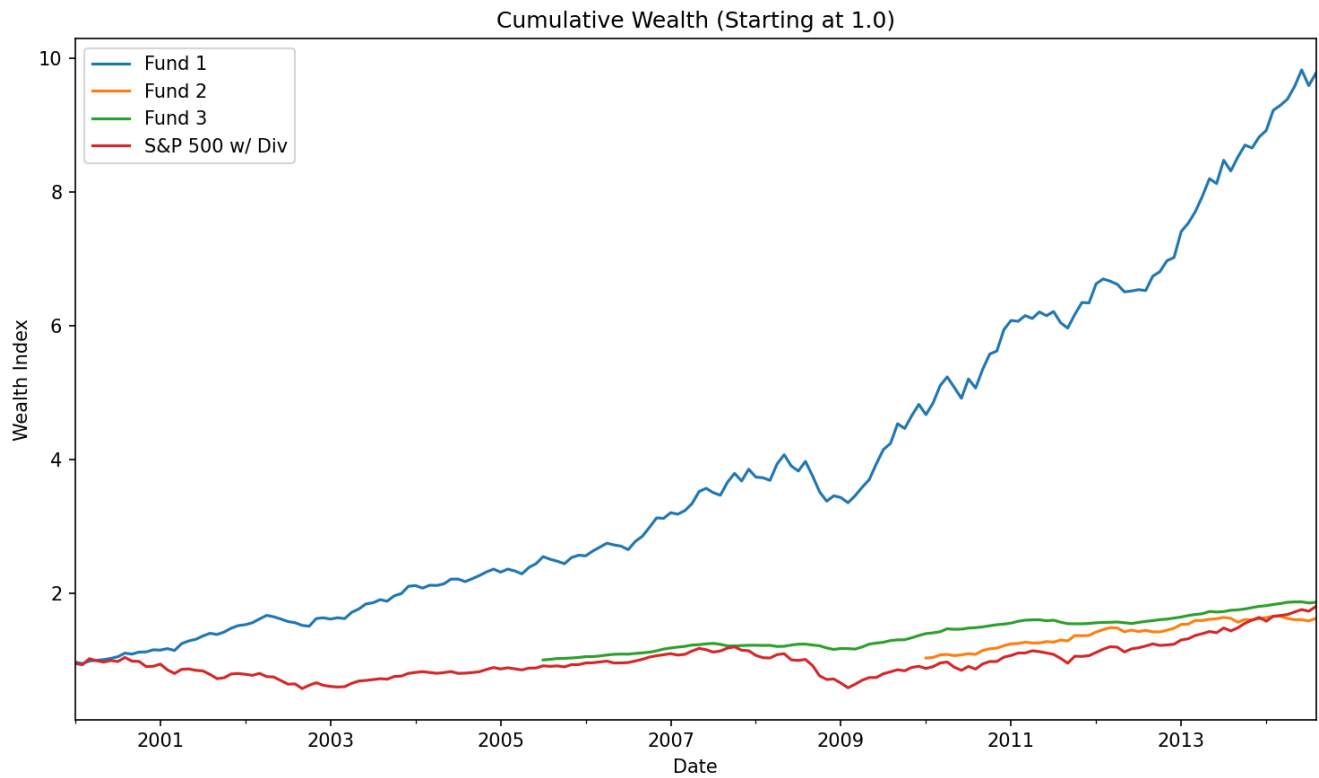


Chart Analysis: The cumulative returns chart shows the growth of \$1 invested in each fund compared to the S&P; 500 benchmark over the analysis period. This visualization helps identify periods of outperformance and underperformance, as well as the overall trajectory of wealth creation. Steeper slopes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

S&P; 500 Benchmark Drawdown Analysis

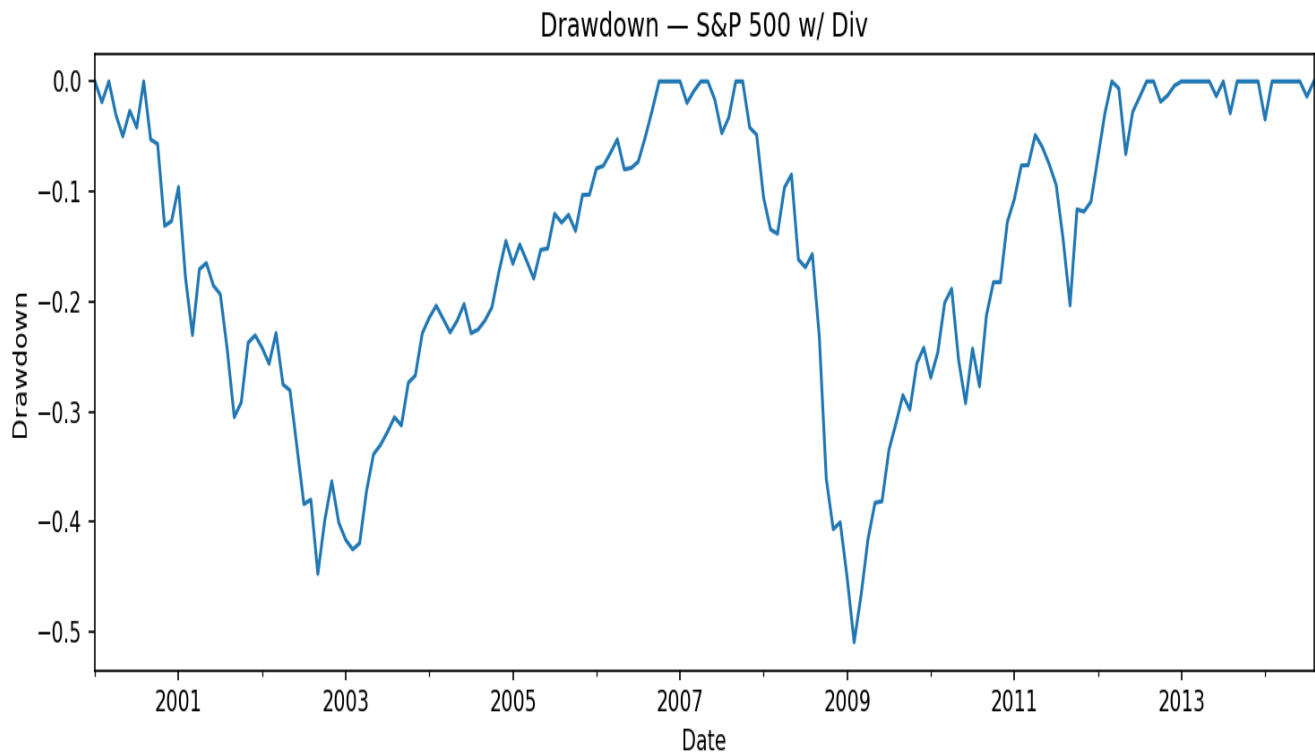


Chart Analysis: The S&P; 500 drawdown chart illustrates the benchmark's downside risk patterns over time. Drawdowns represent the percentage decline from peak values, providing insight into market volatility and stress periods. This serves as a baseline for comparing individual fund drawdown characteristics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

Fund 1 Drawdown Analysis

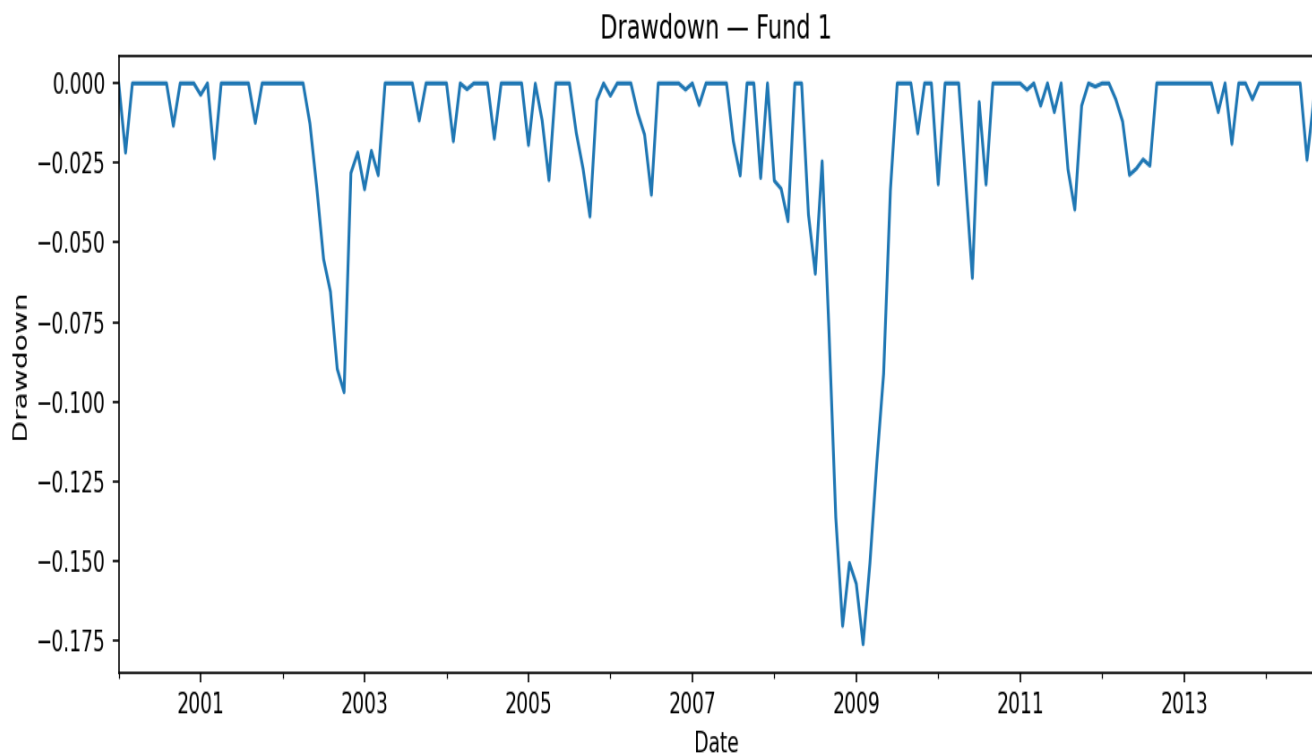


Chart Analysis: The Fund 1 drawdown chart reveals the fund's specific risk patterns and downside protection capabilities. Comparing this to the S&P; 500 benchmark drawdown shows whether the fund provides better downside protection during market stress periods. Higher maximum drawdown of 17.6% indicates moderate 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: HOLD

Rationale:

Good track record, but operational fragility and one-man dependency. Not fraudulent, but not institutionally robust.

Key Considerations:

- Sharpe Ratio: 1.54 (Excellent)
- Alpha Generation: 14.7% (Strong)
- Maximum Drawdown: 17.6% (Moderate)
- Calmar Ratio: 0.95 (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