

# BRK02: Institutional Brokerage Study

Technical Analysis Report | February 01, 2026

## 1. Data Overview

**Subject:** Interactive Brokers (IBKR)  
**Analysis Period:** 2016-02-03 to 2026-01-30 (~10.0 years)  
**Total Observations:** 13,708 rows  
**Stock Data:** 2,513 daily OHLCV observations  
**Data Sources:** Yahoo Finance API (yfinance), synthetic operational metrics

## 2. Methodology

### 2.1 Risk Analytics (CFA Standards)

- **Sharpe Ratio:**  $(\text{Return} - \text{Rf}) / \text{Volatility}$  ( $\text{Rf} = 0$ )
- **Sortino Ratio:**  $\text{Return} / \text{Downside Deviation}$
- **Value at Risk (VaR):** Historical 95% and 99% confidence
- **Maximum Drawdown:** Peak-to-trough decline

### 2.2 Technical Indicators

- **Moving Averages:** SMA/EMA (20, 50, 200 day)
- **Volatility:** Rolling standard deviation (20, 60, 252 day)
- **Momentum:** RSI-14, Price momentum (20-252 day)

## 3. Risk Metrics Summary

Ticker	Total Return	Ann. Return	Volatility	Sharpe	Max DD
IBKR	911.5%	26.1%	32.9%	0.79	-55.1%

## 4. Detailed Risk Profile

### Return Distribution

Metric	Value
Positive Days	53.1%
Best Day	16.12%
Worst Day	-13.01%
Sortino Ratio	1.14

### Value at Risk

Confidence	Daily VaR
95%	-3.09%
99%	-5.50%

## 5. Data Quality Assessment

**Completeness:** All trading days covered  
**Adjustments:** Prices adjusted for splits/dividends  
**Validation:** Stock data from Yahoo Finance  
**Processing:** Pandas/NumPy calculations  
**Disclaimer:** Operational metrics are synthetic/illustrative

## 6. Key Observations

- Sector volatility characteristics relative to market indices
- Risk-adjusted return profile (Sharpe, Sortino)
- Drawdown behavior during market stress periods
- Volume and liquidity patterns

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Data Source: Yahoo Finance (stock), Synthetic (operational) | Report Code: BRK02

Portfolio Sample - Demonstrates data engineering methodology | Generated: 2026-02-01 00:57:53