Finovax Backtrading and Live Testing

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**Project Overview**

This project focuses on developing and deploying an automated trading strategy using Backtrader and Interactive Brokers' (IB) Paper Trading account, aiming to bridge the gap between backtesting strategies using historical data and live trading in real-time markets using IB's API.

**Strategy**

After experimenting with backtesting with the Smooth Moving Average Strategy, I chose to use a a 50-period vs. 200-period SMA crossover strategy. A buy signal occurs when the short-term SMA crosses above the long-term SMA, and a sell signal occurs when it crosses below. The strategy also incorporates Stop-loss orders (3% below entry price) and Trailing stops (5% below peak price).

The strategy was integrated to work directly with IB's paper trading environment, fetching daily market data using IB's historical data API and submitting live paper trades in response to SMA crossover signals. I ran it live during market hours, monitoring AAPL, NVDA, and TSLA, with logs recorded for analysis where it queried IB every five minutes.

**Results & Observations**

**Backtesting Results**

The 50/200 SMA Crossover strategy performed as expected in backtests using historical data. The crossover signals aligned well with observable trend changes, particularly in trending markets where the price showed clear upward or downward momentum. Historical backtesting confirmed the strategy could capture medium- to long-term trends, particularly during bullish periods.

**Live Trading Results**

Unfortunately, during the live trading period, the overall market trend has been largely downward (bearish). Since the SMA crossover strategy relies on upward crossovers to trigger buy signals, very few (if any) trades were initiated in live conditions after I implemented code to look at our current positions. The strategy effectively remained in a defensive "no trade" stance because there were no conditions to justify long positions based on the SMA signals.

**Data Inconsistencies and Issues**

One of the key challenges encountered during live testing was inconsistent data availability from the IB API, particularly when requesting daily historical bars. In some cases, the requested data did not populate in time, causing the script to log errors like "Price data not available" or "Not enough bars for SMA calculation." This could be related to rate limits, market hours restrictions, or connection stability between IB's servers and the ib\_insync client.

When data was available, the order placement and execution process worked correctly in the paper account environment with market orders for buy and sell trades were successfully placed and confirmed.

**Example Log Entry (saved in trade\_logn.txt)**

2025-03-05 10:15:03 - INFO - AAPL - Fast SMA: 184.50, Slow SMA: 192.30, ATR: 3.45

2025-03-05 10:15:03 - INFO - AAPL - Current price: 177.84

2025-03-05 10:15:03 - INFO - Waiting 5 minutes for next check...

**Key Findings**

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| **Aspect** | **Observation** |
| Backtest Performance | Effective in trending markets, especially bullish conditions |
| Live Market Conditions | Persistent downward trend prevented buy signals from triggering |
| Data Fetching Reliability | Occasional failures when querying daily bars (data gaps or IB throttling) |
| Order Execution in Paper Account | Successful for both entry and exit trades during manual tests |
| Logging & Monitoring | Comprehensive logs provided clear visibility into each decision point and calculation outcome |

**Conclusion**

This project successfully demonstrates how I built and backtest the SMA strategy with Backtrader, connected and interact with IB’s Paper Trading Environment, and implemented and monitored my live strategy.

While the current market conditions limited opportunities for full live testing, the infrastructure, logging, and execution mechanisms worked correctly in the paper environment.