QFin Pairs Trading Results Semester 1 2021

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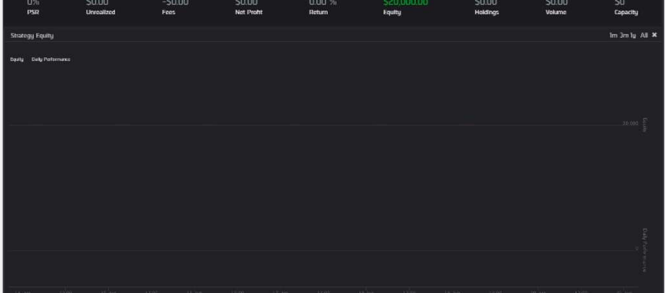
1   Project Overview

The introductory project for QFin UWA 2021 was a pairs trading project in which three teams of four members worked independently to research, design and implement a pairs trading algorithm to be backtested through QuantConnect.

The underlying concept of pairs trading centres on selecting two assets that consistently converge to the same relative price within the market. When the prices of these chosen stocks diverge, taking a long position in one and a simultaneous short position in the other should result in a profit on the future re-convergence of the prices. The trading teams each took independent routes in selecting and creating their algorithms and as such produced drastically different results.

To test the accuracy and consistency of each algorithm two backtests were performed. The first tested the short-term performance in the week following the project's submission (14/6/2021 to 20/6/2021) and the second tested long-term performance over the previous year (14/6/2020 to 14/6/2021).

2   Week Results

With the specified parameters in the project description ($20,000 and 0.01% brokerage fees) each teams algorithm underwent a week-long backtest from 14/6/2021 to 20/6/2021.

	PROFIT/LOSS %	
DAIZAQJENGUS	**-4.85%**	
SEGMENTATION FAULT	**-0.62%**	
EMERALD TRADERS	0.00%	

[DaizaqJengus: https://www.quantconnect.com/reports/1756fb5987bdfccb35616fea29766157]
[SegmentationFault: https://www.quantconnect.com/terminal/embedded_backtest_4e3ac58f30d0ee7992d1f5dd28a79bed.html]
[Emerald Traders: https://www.quantconnect.com/reports/2020069dd211083ce0cb8877e19681d8]

3   Year Results

With the specified parameters in the project description ($20,000 and 0.01% brokerage fees) each teams algorithm underwent a year-long backtest from 14/6/2020 to 14/6/2021.

	PROFIT/LOSS %	
DAIZAQJENGUS	**-87.85%**	
SEGMENTATION FAULT	**17.74%**	
EMERALD TRADERS	**6.50%**	

[DaizaqJengus: https://www.quantconnect.com/reports/ca40713a210a7a2dba9ff41b0a5e9eba]
[SegmentationFault: https://www.quantconnect.com/reports/9d8708739c89e773729b2a96d85d6237]
[Emerald Traders: https://www.quantconnect.com/reports/3c051e8ecba798003d856df908962e4c]

4   Conclusion

Each team took a very different approach to the task and thus produced a drastic range of results. Emerald Traders employed an algorithm that traded off many different sets of pairs, ensuring a less volatile profile as the risk was spread across many assets. The algorithm was also designed to have a higher trade threshold, and thus, traded less frequently relative to the other algorithms. These attributes lead Emerald Traders algorithm to have the most long-term potential, not losing any value at the end of each backtested period. This safe approach has the drawbacks of having limited use as a short-term return algorithm and lowered potential market return when compared to more volatile algorithms. This was realized in the initial week test, as it did not execute any trades over that period.

In stark contrast was Segmentation Fault's algorithm, a heavily risk-oriented algorithm that produced varying results. Its increased frequency of trades coupled with its reliance on a singular pair, lead to it producing the highest return over the year whilst also producing a substantial loss over a week period. Its standard linear mean reversion design showed similar promising results as Emerald Traders, except with a higher variance.

Daizaqjengus's algorithm produced the most consistent results when compared to the other algorithms. It consistently returns a loss at a relatively standard rate in both testing periods. The algorithm has great potential in its design, as an algorithm that expands on the classic linear model, but the execution ultimately failed.