Department of Economics and Business
CENTRAL EUROPEAN UNIVERSITY

BUSINESS MASTER OF SCIENCE CAPSTONE PROJECT
PUBLIC PROJECT SUMMARY

STUDENT

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PROJECT SPONSOR

Client BrokerChooser

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PROJECT DETAILS

Title
Trading Algorithm & Strategies

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Executive Summary:

The capstone project aims to collect the basic trading algo strategies and create an educative content on this and to perform a random walk hypothesis. The hypothesis was that without human intervention, a random strategy will perform as good as the automated algorithmic strategy when using popular indicators as entry signals (other parameters being constant). NinjaTrader 8 platform was used to conduct the back testing for comparison. For random strategy coin toss method was used to create random buy/sell entry signals.

Keywords: Random Walk Hypothesis, back testing, Time-series, cross-over, strategies, indicators.

Objectives:

1. To create an educative content on basic algo trading strategies.
2. To conduct a hypothesis test using back testing, comparing strategies, and drawing conclusions from the data.

Client Background:

BrokerChooser is a Hungarian-based international broker selection company which helps independent investors and traders to find an online broker fitting to their needs. They compare online brokers be it a local one or a large international platform. Browse tests and compare brokers along more than 50 dimensions. Their tutorial videos show you the trading platforms and guide you through the account opening steps. Their articles about online trading provide direction in an industry where finding your way among jargons and lingos is a challenging even for professionals.

Work done:

The first task of this project was to write an educative article on trading algorithmic strategies which required a lot of research, web scraping and restructuring the content to develop a comprehensive write-up on various algorithmic strategies popular in the market. The second task was to test the random walk hypothesis for which we used online trading platform to compare random strategy with popular indicators.

Benefits to the Client:

BrokerChooser provide consultancy to independent investors and traders and this comprehensive write-up on algorithmic strategies will help them with their future consultations. The hypothesis testing provides proof that along with algorithmic strategies human intervention is required to managing the positions during the trading time.

Conclusion:

Comparing results of random walk with strategic indicators

Performance	Random Entry	SMA	EMA	RSI	Stochastics
Total net profit	$ -38,938	$ -1,904	$ 2,545	$ -2,390	$ -3,834
Gross profit	$ 1,10,313	$ 1,23,038	$ 1,34,731	$ 1,77,363	$ 1,23,625
Gross loss	$ -1,32,750	$ -1,17,131	$ -1,23,256	$ -1,69,113	$ -1,19,369
Commission	$ -16,500	$ -7,810	$ -8,930	$ -10,640	$ -8,090
Profit factor	0.83	1.05	1.09	1.05	1.04
Max. drawdown	$ -22,562.50	$ -6,163	$ -5,781	$ -12,963	$ -10,338
Probability	99.99%	29.01%	13.92%	27.84%	35.69%
Total # of trades	1650	781	893	1064	809
Percent profitable	35.64%	45.07%	45.13%	46.62%	44.25%
# of winning trades	588	352	403	496	358
# of losing trades	1062	420	477	561	442
# of even trades	0	9	13	7	9

From the results of hypothesis testing, it can be said that human intervention is needed for managing the positions during the trading time. There is one exception the EMA, but if we calculate with rollover fees, that will go negative also. We know that there are many variables that influence market movements which results in breakouts but in general prices move in trends. Even though it is hard to predict the future price direction but using algorithmic indicators we can speculate how the market will perform and can take a profitable entry position.

Learning Experience:

This project helped me get a deeper understanding on trading designs and technologies. How to perform the technical analysis of stocks using price action and market movements. I learned a lot about various momentum, trend following strategies and how traders use mathematical models to create trading systems. While creating the write-up on algorithmic strategies, I learned a lot about content creation. I understood all the algorithms and strategies traders use to speculate market movement and how they take advantage from these strategies to enter and exit market at the right time to maximize their profits.

This project also helped me understand how day trading works. How traders use various indicators and strategies to speculate price movements. How support and resistance is used to minimize losses. How to develop profitable automated and semi-automated trading systems. I learned about various trading platforms and what features they provide to help traders developing complicated trading systems. How to run back tests and forward tests on simulation mode to test the strategies on historical data and in real time, respectively.