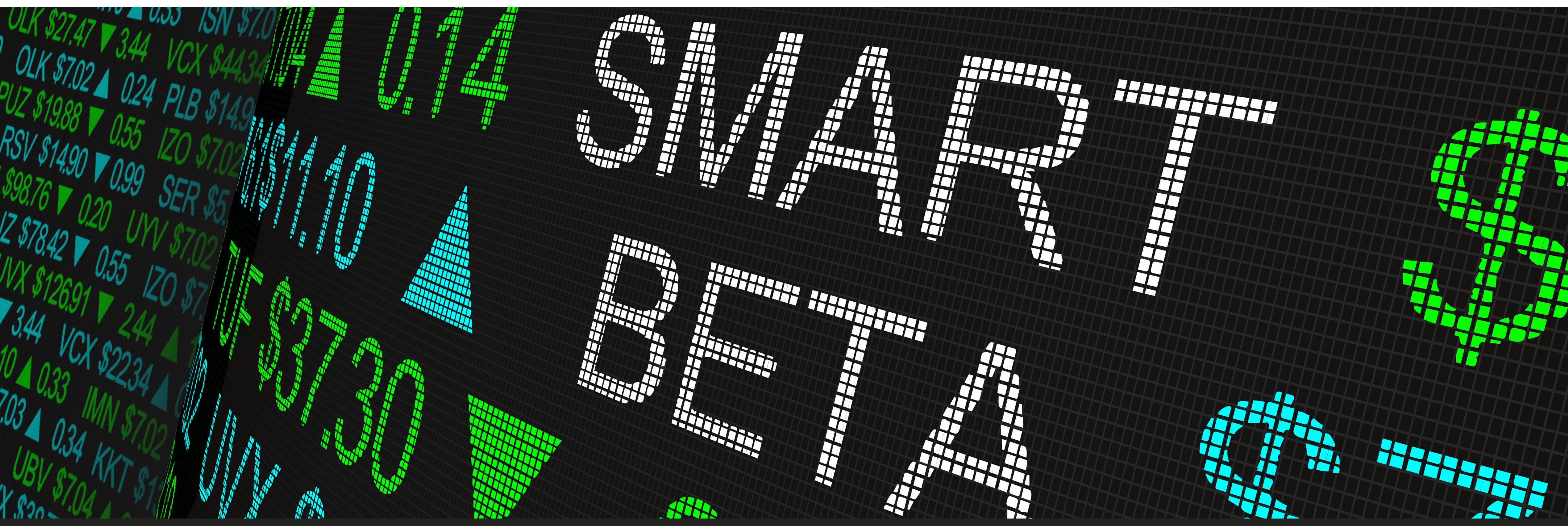


AN EMPIRICAL STUDY OF ELECTRONICS INDUSTRY BASED ON SMART BETA USING PYTHON: TAIWAN STOCK MARKET AS AN EXAMPLE

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ABSTRACT

This paper analyzed the effectiveness of selected factors and the assumption of beating the Taiwan stock market. Taiwan electronics industry was selected as a benchmark because of its large market share in the stock market. The industry is deeply affected by the business cycle. Companies that can maintain long-term stable profits at lower fixed costs are considered to have higher investment value. Smart beta is recently one of the most popular investment strategies. EBT growth/ net sales growth was selected as factors to measure how much a company makes a profit from a dollar of sales after paying variable costs and filter the abnormal performance of small companies. To answer this question, the author compared the performance of the constructed portfolio with the performance of Taiwan Electronics Index (TELI) using Python as the main analysis tool. His results proved that according to the historical data, the portfolio could literally achieve three times higher return and ten times higher Sharpe ratio than TELI. His analysis was also accord with the effectiveness and the assumption.

INTRODUCTION

The author chose the electronics industry because stocks of the electronics industry have a huge impact on the performance of the capital market, and it is also the focus of Taiwan's stock investment.

In fund investments, Smart Beta is currently a very popular investment strategy. Smart beta Strategies combine the benefits of passive investing and the advantages of active investing strategies.

Although some professionals claim that smart beta cannot beat the market and even underperforms than the benchmark index, the author believed that the existence of the effectiveness of smart beta and excess return based on the empirical study on the portfolio which is simulated using Python.

Initially, before constructing the portfolio, the factor, duration, rebalance frequency, missing values and the number of samples per quarter should be determined which can have a significant impact on the return of the portfolio. Further, by comparing industry characteristics and the effect of factors among weighting methods, factor-weighting method is utilized to strengthen the representation of the portfolio. Finally, from the comparison of respective run chart, return, Standard deviation, Sharpe ratio, Max drawdown, and Odd ratio of the portfolio and the benchmark index, the effectiveness and the assumption of beating the market can be verified.

PREPARATION OF PORTFOLIO

SELECTION OF WEIGHTING METHOD

- Missing Values
- Factor
- Rebalance frequency
- Duration
- Number of constituent stocks per quarter
- Equal-weighting
- Factor-weighting
- Market capitalization-weighting
- Portfolio

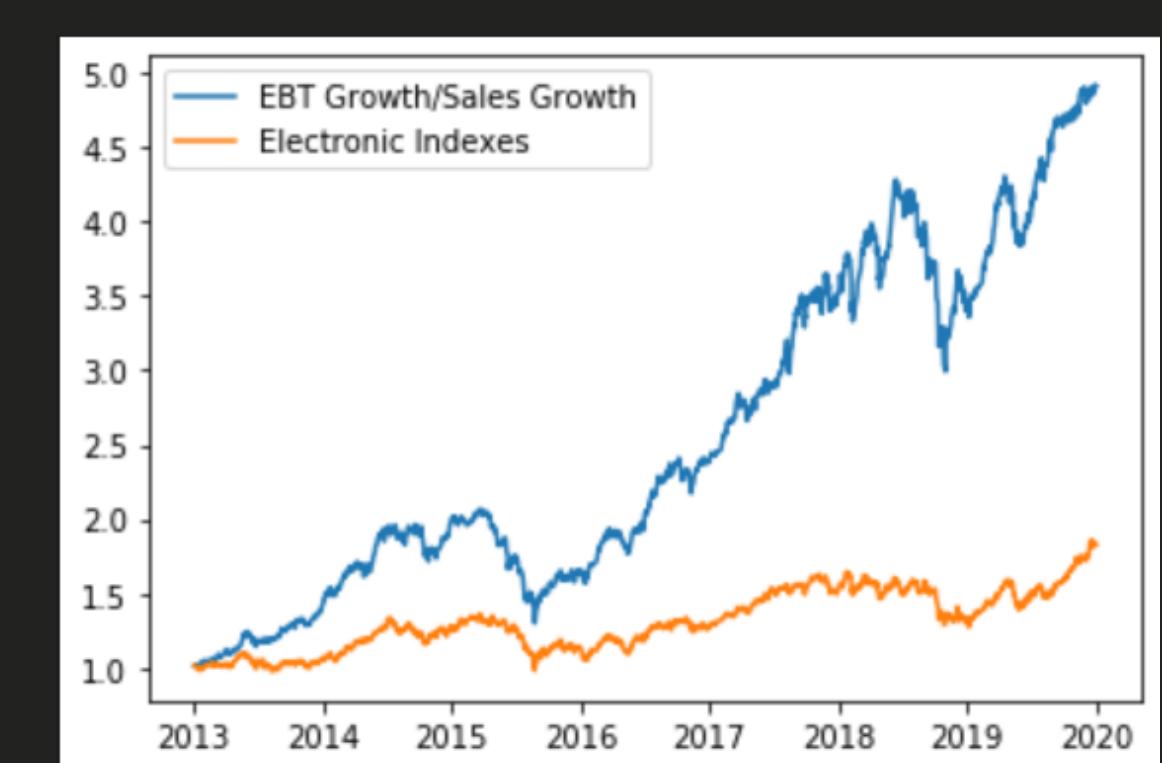
CONCLUSION

In this paper, the author wanted to verify the doubt that smart beta couldn't beat the market and the doubt of the effectiveness of smart beta. He chose Taiwan stock market as the trading market and the electronics industry was his research object. In addition, Taiwan electronic index was its benchmark index. He then selected the EBT Growth/Sales Growth as a factor to form the portfolio and rebalanced every quarter with Python. Next, he compared the performance between the portfolio and the benchmark index. From the results, it can be proved that the effectiveness of smart beta literally existed. Moreover, smart beta strategies could indeed beat the market and enjoyed greater excess return.



DISCUSSION

COMPARISON OF PORTFOLIO AND BENCHMARK INDEX



	ER	STD	Sharpe	Mdd	Odd
Benchmark	0.09	0.15	0.61	0.28	0.53
Portfolio	0.26	0.17	1.58	0.37	0.60