ISSN 2616-5902 Vol. 4, Issue 5: 6-9, DOI: 10.25236/AJBM.2022.040502

Development Trend Analysis and Prediction of Photovoltaic Building Integration Plate Index

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Abstract: *The thesis focuses on how to find a probability local optimal solution that maximizes relative benefits in the ever-changing stock market, and establishes a stock model for future expected trends and an investment analysis model that optimizes returns. First of all, the background and error analysis at that time should be obtained through the establishment of each stock market value and sector index, and the relevant information should be inquired, and the functional relationship between the corrected value and the original value should be obtained, to build three different models of related moving averages. For different model analysis and data processing, use ARIMA model and grey model to simulate its future expected trend, and use third-order difference to improve images and data, and compare some major events that have occurred recently to make an artificial background. Correction, and finally get a time-dependent model of it. For the establishment of the investment model, the relevant knowledge of probability theory is used to carry out continuous linear combination of high-quality solutions, the high-temperature annealing model is used to narrow the scope, and lingo is used to solve the local optimal solution, so that the risks and benefits can be optimized.*

Keywords: *Optimization method; Stock market; Moving average; ARIMA model*

1. Introduction

Building integration of photovoltaics is to make full use of industrial buildings, roofs of public buildings and other resources to implement distributed photovoltaic power generation projects. It plays an important role in the realization of "carbon peak" and "carbon neutrality" in my country. At present, Beijing, Tianjin, Shanghai, Chongqing, Inner Mongolia, Zhejiang and other 31 places have issued relevant policies for the next three to five years of building photovoltaic integration, which will have a certain impact on the development of listed companies related to building integrated photovoltaics. In stock trading software, each stock has a daily K line (composed of the opening price, closing line, highest price, and lowest price), as well as a moving average (5, 10, 20, etc.) The analysis of K-line and moving average can know the trend of each stock. There is a sector index in the stock market (relevant indices are generated by different weights of individual stocks in the same sector), which is an overall reflection of the trend of the sector. The building-integrated photovoltaic sector is an emerging sector. By predicting the development trend of the sector index, we can understand the future development trend of the corresponding industry in the sector.

2. Our Method

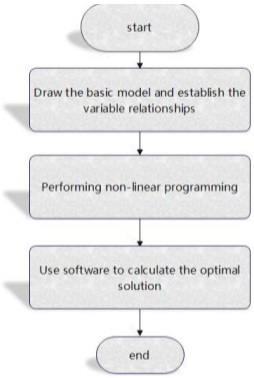

Figure 1: General flow chart of model establishment

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Based on the above analysis, we have established a stock sector investment plan model, and the overall flow chart is shown in Figure 1.

2.1. Data preprocessing

Through the preprocessing of the data, we found that there is actually a certain lack of data, and we have improved and completed the missing data by averaging the adjacent upper and lower data. We calculate the new shares from the fourth day after joining The Southern Grid Energy and multiply the subsequent market capitalization by the correlation coefficient. Use Excel's own function to establish models and process data. After obtaining the sector index, the period fitting of the moving average is given to it.

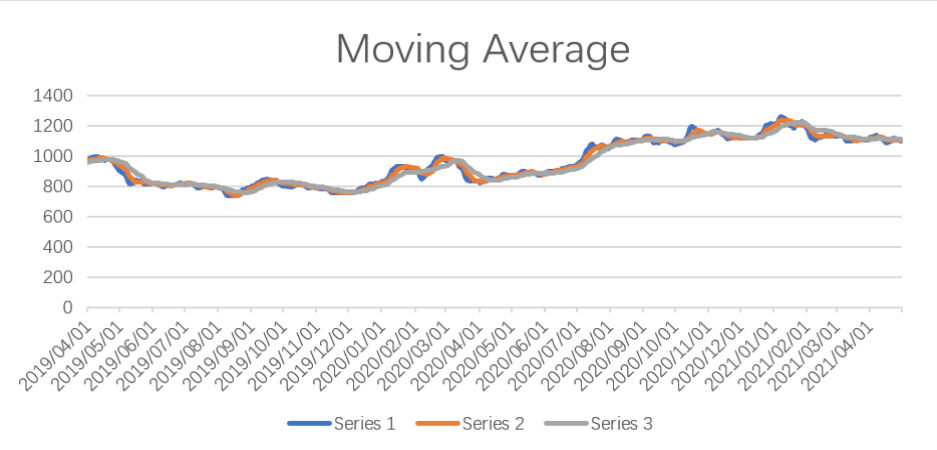

Figure 2: The moving average

Perform error analysis on the established model and revise the model, predict the future development trend of the sector according to the revised model, and give the daily moving average for 20 trading days after May 28, the weekly moving average for 3 weeks, 2-month monthly moving average.

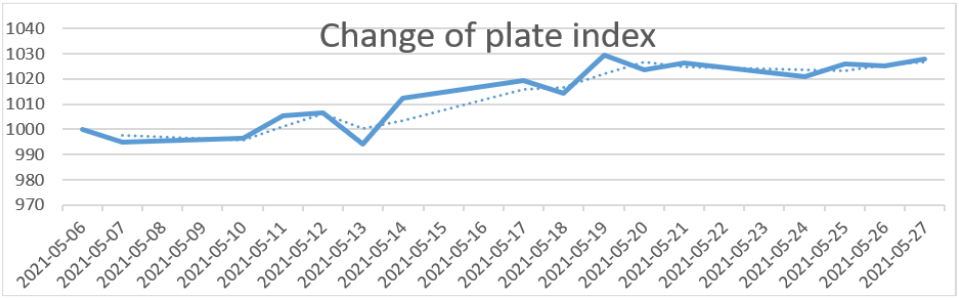

Figure 3: The plate index change

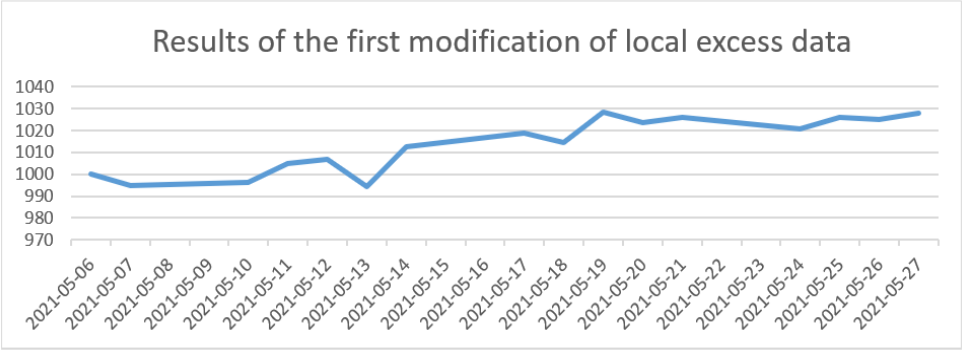

Figure 4: The result of the first modification to the local excess data

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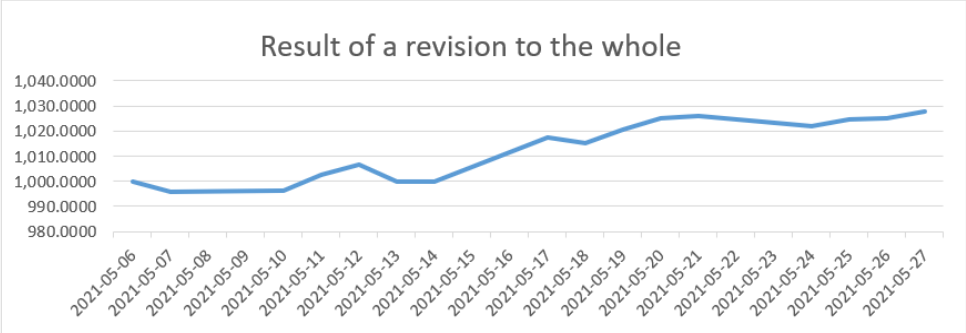

Figure 5: The result of a correction for the whole

Figure 3 is the data before correction; Figure 4 is the first time to optimize and correct the abnormal data of local individual stocks, and the correction function used is:

$$P'x=Px*(1-i*i) \quad i>0 \tag{1}$$

$$P'x=Px*(1+i*i) \quad i<0 \tag{2}$$

The local abnormal stock index refers to the absolute value of the increase i of the day exceeding 5%. Figure 5 shows the result of the second overall optimization. The correction function used is: (here n is 37)

$$P=P*(1-n*i*i) \quad i>0 \tag{3}$$

$$P=P*(1+n*i*i) \quad i<0 \tag{4}$$

2.2. Error analysis and model prediction

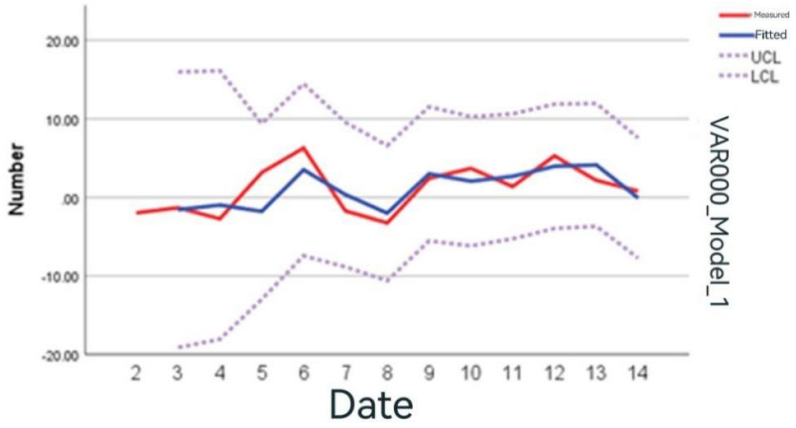

Figure 6: The model Fitting Prediction Result Plot

Because the market is changeable and greatly influenced by various external factors. We artificially cannot control all the information and unpredictable force majeure. In fact, under the condition of excluding various extreme factors, the daily trend of the stock market is not only affected by the company's own economic development, but also mainly controlled by various capital predators, as well as the poor information and information held by people of different classes. The education received has a certain impact. On the basis of the existing data and conditions, the correction index has been modified and perfected, so that it is better close to the conditions, and it is convenient to reduce errors and accidental conflicts. The following is the first-order difference prediction model established by SPSS and python according to the ARIMA model, and compared and verified with white noise.

3. Conclusion

In this paper, certain data processing and analysis are carried out on the benefit and increase of photovoltaic building integration in the stock market at different times, and the relevant investment optimization model and the optimal solution are established. For the moving average, this paper adopts the function modeling in Excel, summarizes and processes the scattered data, and calculates each model

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to obtain the final moving average of each day. For error analysis and data correction, a gray comparison was made, and special points with abnormal fluctuations were selected, and the reasons were obtained after relevant investigations. From this, further analysis and understanding of the stock market were carried out, and finally the overall Volatility is subjected to an increase analysis and a certain function correction is made to be the best model. After this, the expected future development of the stock is extrapolated by SPSS and python modeling. We carried out module optimization on the basis of the model. After changing the time trend, we can use the module with a better solution to redesign the module. Finally, the optimal model is finally established by using the high-temperature annealing algorithm and lingo modeling. Although the data given in this topic is relatively large, the data types are relatively simple, so the market volatility considered in fact is greatly reduced, which has greatly hindered the establishment of model accuracy. It is expected to be added later. Gray model and other prediction models, and use python crawler technology to obtain certain required data, and then further improve this model.

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