Mediocre Social Network Apps Are Facing Great Challenges

Written by: Jiani Song, Haoyan Zhang, Xihuan Zhang and Jiuli Hou on May.3.2020

Market Overview

Social media statistics from 2019 show that there are 3.5 billion social media users worldwide. Notice that this is about 45% of the current whole world population (Mohsin and Anderson, 2020)[1] and this number is continuously growing. The top ten popular networking sites, including Facebook Inc., LinkedIn Corp. and Twitter Inc., hold most of the market share. For example, roughly two-thirds of U.S. adults (69%) report that they are Facebook users (Perrin, 2019)[2].

Mediocre Social Network Apps Incorporated, in this monopolistic market, has struggled for a few years as people's preferences change. We made a forecast for its stock price for the following ten trading days, which can be used for making a future plan to accomplish business goals as well as to secure a competitive position in the market.
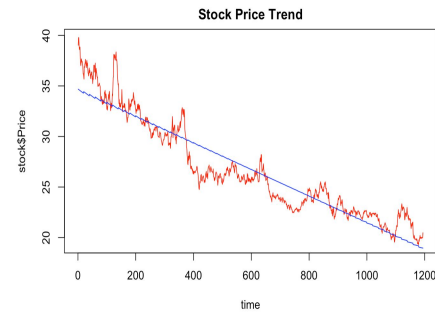
Data Analyzing

Mediocre's stock price from January 2015 through the end of September 2019 is shown by the above plot. We can see a generally declining trend with some periodic ups and downs, which becomes less obvious over time.

The downward trend is reasonable due to the fact that social networks products are facing many challenges, such as difficulties to monetize, marketers moving in and users moving out, privacy concerns mounting as developers move in, and etc. All these phenomena indicate that social networks are facing great challenges so their stock prices are decreasing as a whole. On the other hand, from years to years, we can see that there are some spikes in between, which typically happen during October, but followed by the continuous decline from November to January. Those seasonal signals should be a necessary part that we must take into consideration during the model selection phase.

Fitting Model

It will be helpful if the company can use the existing data to fit a statistical model to predict its future stock price. It could help the company to come up with better strategies to make profit or prevent loss. Observing the downward sloping trend in the time series plot for the past five years' stock price, and through some analysis, we come up with several potential models, for instance, the linear or quadratic models combined with seasonal autoregressive integrated moving average models.

We separate the historical data into a training set and a test set to find the best model among those candidates. We use information criteria values to test models' in-sample performance, and then use the cross-validation process to test models' out-of-sample performance.
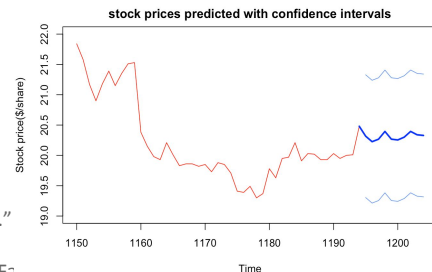
[1]Mohsin, Maryam, et al. "10 Social Media Statistics You Need to Know in 2020 [Infographic]." www.oberlo.com/blog/social-media-marketing-statistics.
[2]Perrin, Andrew, and Monica Anderson. "Share of U.S. Adults Using Social Media, Including Fa........, ...,.. ... . Research Center, Pew Research Center, 10 Apr. 2019, www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/.

Through the above processes, we find our best model, which is the linear model combined with an autoregressive model.

Prediction and Recommendation

After selecting the best model, we forecast the price of the stock for the next 10 trading days : 20.32, 20.23, 20.27, 20.39, 20.27, 20.25, 20.30, 20.40, 20.34, 20.33. The prediction indicates that the stock price will have a small decline after an increase and then followed by a relatively constant trend. However, from the long term perspective, the Mediocre Social Network Apps are experiencing a decreasing trend. They really need to take action immediately, just in case the worst scenario happens. For example, they could think of some ideas to promote their APPs to attract more investors, thus improving the company's competitiveness. Or, they could seek professional advice to protect the company's assets and thus prevent future loss.