5. CONCLUSION

In this research, we built a GAN model to assess the impact of bot tweets on financial stock market price especially Facebook. In order to feed a Twitter textual data to the model, sentiment analysis is applied to the data for obtaining sentiment score of each tweets. Moreover, tweets data is split into two datasets, tweets written by bot and human users. Next, the built GAN model is trained with an input including the each tweets data and an input without these textual data to estimate the difference in the resultant errors.

Since the Root Mean Squared Error for the test data obtained from the trained GAN with input including human tweets decreases more than that of bot tweets. It can be assumed that since human user has more number of positive textual data than bot, which is consistent with the positive trend of Facebook stock data, adding human tweets to the input feature increases the model performance. Moreover, we compared the performance of three models, GAN, LSTM and SVR trained with input including textual data analyzed by VADER sentient tool in the basis of error metrics, RMSE, MAE and MAPE and obtained the result that GAN outperformed other two models in terms of average score in all three metrics. Therefore GAN is capable of predicting the stock closing price of Facebook.

5.1 Future Work

Sentiment Analysis
For textual data, tweets, is analyzed using 5 sentiment analysis tools including WordSentiNet, AFINN, SO-CAL, VADER and TextBlob in this research. To improve sentiment analysis, deep neural network trained in unsupervised manner can be applicable where the vocabulary used in the dataset is as close as possible to the vocabulary used in Twitter data by replacing each word with its synonym which is ideally used in the Twitter data. A synonym of a word can be found by taking cosine distance of each word which is represented by pre-trained word embedding. If vocabularies used in a dataset is close enough to the vocabularies used in Twitter data, then the accuracy of sentiment analysis can possibly be improved.

GAN stock market prediction
For further research of the prediction of stock market price using GAN, since Facebook's

stock data used in this research is 80 days in order to meet the length of date in Twitter data, one possible research could be selecting different stock price data having longer duration, for example more than 3 years of stock data and investigate the error of the model. Moreover, Adding more textual data, for instance Reuters news and other financial news, is possibly improve forecasting result.