CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study aimed to predict the stock prices of CIMB and Maybank based on sentiment analysis of news headlines using machine learning techniques. The study begins with data collection and preprocessing, followed by the sentiment analysis of the news headlines and lastly evaluate the machine learning models. The data was prepared by scraping the headlines news related to financial while the stock price data are extract from the yfinance. The data was then cleaned, standardized, and merged into one dataset. VADER tool was used for the sentiment analysis of news headlines. The sentiment was classified into three category which are positive, negative, and neutral. These sentiment scores then combined with stock price data and the dataset is used to train the machine learning model.

To predict the next day closing price, three deep learning model were evaluated. It was found that ACNN-LSTM model demonstrated the best performances for both banks compared to the LSTM and GRU. For CIMB, it achieved the lowest MSE (0.06), RMSE (0.244) and MAE (0.187). Like CIMB, Maybank also achieved the lowest MSE (0.054), RMSE (0.232) and MAE (0.177) for the model. Based on the result, it can be concluded that ACNN-LSTM model is capable to predict stock price accurately and sentiment analysis help to improve the result.

Additionally, the study examines the relationship between the number of news headline and the stock price. It was found that there is no direct linear relationship between both. However, it was observed that there is stock price movement when the headline volume is increasing for Maybank. This suggest that the volume of relevant news indicate there is market activity. Combining sentiment analysis with headline volume could result to more accurate prediction of the prices.

In conclusion, sentiment analysis can be used to improve accuracy in predicting stock market prices when combine with ACNN-LSTM machine learning techniques.

5.2 Future Works

There are few gaps that need to be addressed in the future work from this study. Therefore, this study proposes a few suggestions that will be useful for future research to improve the effectiveness of sentiment-based stock price prediction models.

This study only focusses on the three deep learning model. The future study could explore other deep learning architecture especially transformer based to improve the accuracy of the prediction. The study also could focus in the volatile for financial markets. Additionally, the current model could integrate more variables that influencing stock prices. For example, inflation rate, interest rate, and exchange rate could provide a comprehensive analysis for stock price prediction.

As this research was focused solely on CIMB and Maybank in Malaysia, future research can focus to expand the scope of study. It because it will help in assessing the generalizability of the findings. Beside that, a comparative analysis across market could offer insight about the performance of sentiment-based prediction in various financial environments. This will help to identify either the model is applicable globally and show the different market movement of the regions.

This study only used historical data and sentiment analysis. Future research can focus on real-time data processing. By integrating live sentiment analysis with stock market data, the model will become more responsive to real-time market changes. This will enable investors to make decision based on the latest news, proving the model ability to adapt into real-world trading market.

Lastly, future study could explore about the longer-term prediction such as weekly or monthly for stock prices forecasting. A longer prediction time would help to provide valuable insight to investor for investment strategies.

In conclusion, to develop accurate, adaptable, and comprehensive stock prediction models, several areas of improvement could be address based on this research for

future study. The insight from the new model about the market behaviour could be used for investor and policymaker in making decision