Assume a naive investment strategy used to evaluate whether the prediction is accurate and meaningful. Suppose the current day’s closed price of one stock and the prediction of its tomorrow’s closed price are known. For example, if one stock’s price is projected to increase 3% on the next day, 3 shares of this stock will be purchased. If it is projected to decrease 2%, 2 shares will be sold out. Calculate the daily return with the real closed price. Finally, calculate the annualized returns for these 20 days. The result is shown in the table.

For HMM model, the investment will turn into positive returns on 3 stocks and negative returns on 2 stocks. The profits from these 3 stocks are notably higher than the loss from those 2 stocks. Therefore, if a good portfolio is designed, profits can be ensured from the prediction, which indicates that the prediction is informative and useful.

For time series model, sometimes the investment will earn a large profit and sometimes may make a great loss. This prediction is not so satisfying because of great risk and the expected returns are less than that of HMM model.

The reason may be because HMM model takes more factors into account than time series, such as open price, high price, low price and price difference. It is proved by Neural Network that closed price is indeed influenced by these 4 factors. Moreover, HMM model predicts one day in one prediction while time series predicts 20 days in one prediction. Long time prediction may lead to more discrepancy.