CHAPTER 1
INTRODUCTION

1.1 Rationale

Indonesia Stock Exchange (IDX) is a place to trade the stock market in Indonesia. In general, this is represented by the value of Jakarta Composite Index (JCI). JCI itself is the combined value of all stocks listed on the Stock Exchange. It does not matter whether the stock traded on that day is in a state of rising, down, flat (no change in value), or not being traded and even suspension (prohibited from conducting transactions for a certain period of time).

This the place where people can see and assess the condition of the Indonesian economy in outline, whether it is in good condition or not. If the movement of stock value on the IDX represented by JCI in rising conditions, then the Indonesian economy is also considered to be improving. The value of JCI rises, of course investors will be happy because there will be some shares that have in rising condition (a chance to gain profit if the investor decides to sell).

On the other hand, if the movement of stock value on the IDX represented by JCI in a down condition, then the Indonesian economy is also considered to be deteriorating. When JCI value is down, of course investors will be anxious because there will be some stocks that have in down conditions (a chance to lose if not immediately sold).

Since 2014, the IDX began to actively provide seminars and established the club investor branch (investor club) in various regions and major cities in Indonesia including Bandung. Besides trying to recruit young investors Indonesia to invest in the stock market or future exchanges, IDX is trying to attract retailers / other national companies to register his company to be listed on the trading floor through the mechanism of Initial Public Offering (IPO).

Until now, the majority of stock analysts, a speaker or invited speaker on the show news about the stock in the TV private such as Kompas TV and TV One, recommends stock purchase mainly banking sector stocks (such as BNI, Mandiri, etc.) or belonging

in stock LQ-45 [See Appendix A for more information]. And if people want to pay attention to the price per sheet in LQ-45 first in any stock purchase should be at least 1 lot (100 shares), can be said would be burden some for beginners (traders) are still short-term thinking in interesting profit results. Unlike investors with large capital, they are able to think and hold the stock for the long term at least 1 year.

There are still many traders trapped in stocks that have been purchased, including IPO stocks. The time of purchase, the investors are eager to buy / sell stocks concerned. But frequently after the moment of the IPO, the stocks immediately freefall and survive on the lowest level. For long-term investors may be no problem because they are able to hold their stocks for many years until the price back up. But it would be a serious problem for the young trader, and often must 'swerved' to sell at a low price which would generate losses as the forced sale of stocks.

Quite often traders get stuck into 'sleep stocks'. Sleeping stock is a stock that rarely traded. Even if there is a transaction, it is often made by interested parties in the company in order to remain listed on the stock exchanges where the stocks are listed.

The characteristics of the sleeping stock are stocks that at the beginning seems to fluctuate, but then ends flat at constant prices for at least 6 months in a row, no movement even with the presence / absence of activities stock transactions relation and are only active for a few weeks, then return flat again. Sleeping stock is usually relatively flat at the price of IDR 50 / sheet stock.

But if stock prices are flat in constant prices, not only at the price of IDR 50 / share, but also there is no transaction activity and has lasted for 6 months to 1 year more, it can be sure that the stock is no longer classified as 'sleeping stocks', but stocks are threatened to be removed from IDX exchange membership (delisting).

Jakarta Composite Index (JCI) is a value used to measure the combined performance of all stocks listed on the Indonesia Stock Exchange. JCI can be used to assess the general market situation or measure if the stock price has increased or decreased. The rise of JCI shows excitement, whereas the down of JCI indicates that the market is sluggishness [1].

When there is an increase in JCI, of course stock investors are excited because they achieve a profit as much as the price difference between the current sales price and the purchase price of the stock before. In contrast, when JCI has decreased, of course,

mostly small / large investors are experiencing a panic with the action of release the stock.

1.2 Theoretical Framework

For the theory, Backpropagation algorithm is applied. Backpropagation is method for pattern recognition besides Perceptron, Adaline and Madaline. Backpropagation uses data input, hidden neuron and data output for estimating the forecast value ahead based on given data source. Backpropagation is better than the other three pattern recognition methods for time series case.

To obtain how much data input is needed for forecast stock value ahead, it needs to know how many days stock price are searched. This is depicted on the following table:

TABLE 1.1: Variation how much days during stock trading

Option	**Length**	**Information**
Weekly	Max 5 days	Total workdays in 1 week, without free day like sunday or national free day
Monthly	20-25 days, sometimes 26-27 days	Total workdays in 1 month, where it include 4-5 weeks, without holiday and addition several workday out of end of weekday
Yearly	Average 240 days	52 weeks multiple 5 workdays, minus how much holidays in that current year

Next step, is to know how much input for forecast stock price used in Backpropagation methods, it must be set to one value for input variable. This is depicted on the following table:

TABLE 1.2: Variation how much data input we needed in Backpropagation for both 1 month and 3 months

Option	**Length**	**Information**
Daily	20 data	Total workday during 1 month. Where 1 month = 4 weeks, and 1 week = 5 days. So for input, there are 20 days for input in a row.
Weekly	4 data	Total weeks in 1 month. Where weekly data only choose the first day in every weeks. So for input, there are 4 data for input in a row.

Option	Length	Information
Monthly	1 data	Total weeks in 1 month. Where monthly data only choose the first day in every months. So for input, there are only 1 data for input in a row.

1.3 Conceptual Framework/Paradigm

In this case, ANN Algorithm is used. Like Backpropagation algorithm. Backpropagation is the major algorithm used for prediction.

It is necessary to remember that for stock price case, prediction calculation for daily, weekly, monthly and yearly, is not based on calender day. But based on how much active workday during that interval (without free day like sunday or national free day), or you can see it in table 1.2 above as a reference.

1.4 Statement of Problem

Predicting stock price become challenging for this decade [2]. So many previous researchers to find the best model for predicted stock price like Jay Desai, Arti Trivedi and Nisarg A Joshi (2013) [3]. This research uses closing price data as training and testing data set, unfortunately from his experiment only reached training accuracy result is still 59.84% and the average testing accuracy is 82%.

The data used by Jay Desai, Arti Trivedi and Nisarg A Joshi are the homogeneous data in the form of price out (close) S & P CNX Nifty 50 Index. Trading data used by it is from January 1, 2010 to December 31, 2011. Jay Desai use neural network with one input layer, one hidden layer and one linear output layer. 10 input variables are used with 10 neurons in the hidden layer. All networks tested in the study are trained for 3,000 epochs.

So based on this result, I want improve that accuracy better than him. I will make propose new neural network architecture with one input layer, one hidden layer and one output layer, where input layer contains 20 input data, 10 hidden neurons in hidden layer and 1 output data in output layer.

1.5 Objective and Hypothesis

Objective:

The purpose of this research is to predict the stock prices portfolio with prediction accuracy greater than 82%.

Hypothesis:

This prediction can be achieved by ANN method and its accuracy value can be greater than 80% for BNI, BCA and Mandiri stock and stock price portfolio greater than 80%.

1.6 Assumption

Stocks are tested, all in normal condition (corresponding historical stock price data are available). The condition is not according to existing financial and economic crisis.

1.7 Scope and Delimitation

Scope:

The BNI, BCA and Mandiri stock price data are collected during 5 years from January 1, 2011 until December 31, 2015, and will be predict for 1 month and 3 months ahead.

Delimination:

This experiments use 3 types of stock as an illustration on an investor's portfolio. Like stocks of BNI, BCA and Mandiri during 5 years from 2011-2015.

1.8 Significance of the Study

This study can be used to learn, explore and analyze the factors that influence the increasing and decreasing in the price of stocks traded on the Indonesia Stock Exchange (IDX). It is expected that this study can be used by stockholders to predict stock price.