

CHAPTER I

INTRODUCTION

1.1 Background

Probability theory can be understood as a mathematical model for the intuitive notion of uncertainty. Without probability theory all the stochastic models in Physics, Biology, and Economics would either not have been developed. These processes are the basic of classical probability theory and much of statistics. The possible outcomes for each experiment are the same and occur with the same probability when a sequence of chance experiments forms an independent trials process.

The idea of the Hidden Markov model appears to have first come out in the late 1960's at the Institute for Defense Analyses (IDA) in Princeton, New Jersey. The HMM model attempts to address the characteristics of a probabilistic sequence of observations that may not be a fixed function but instead changes according to a Markov chain. Stochastic process on the gold price, have several factors that cannot be ascertained and formed a markov chain, hence used Hidden Markov Model method to overcome the case.

Gold is one of the precious metal that has the characteristic of zero inflation. Because of its flexibility people tent to invest their money in gold recently. Naturally, gold price is formed a stochastic situation. However there are odds that it will decrease over time. Before investing their money into gold people need to know the market trend for gold itself. Therefore, they need specific method to read the trend.

According to Wai Ki Cheng et al., (2004) Hidden Markov Models have been widely used in science, engineering and many other areas and have been successfully

applied in engineering problems such as speech recognition, DNA sequences, electrical signal prediction and image processing, etc.

Previous researches for Hidden Markov Model have been done by Lukman Zaman, (2003) with On-Line Chinese Character Recognition Using Hidden Markov Models, Detection of machine failure: Hidden Markov Model approach by Allen H. Tai (2008), Application of Hidden Markov Model to Automatic Speech Endpoint Detection by Wilpon and Rabiner (1987) in which Hidden Markov Model is useful for speech reorganization. Hidden Markov Model has also been used by Yuni, (2009) in Penerapan Hidden Markov Model pada Peramalan Harga Premium.

However, the Hidden Markov Model is never applied for predicting gold price before. The research was conducted to investigate the Hidden Markov Model to be applied in time series forecasting to know the gold trend.

1.2 Problem Formulation

Based on the background, the problem formulation to be solved is how was the market trend of gold based on Hidden markov Model method?

1.3 Scope of Research

There are some boundaries in this project. There are:

- a. The research object is minted Gold price per grams in Rupiah.
- b. The domain on the research is limited for January 2008 until December 2010.
- c. The causative factor used in this research are new academic year and crude oil.

- d. Tool used in research are Matlab® and Microsoft Excel.

1.4 Objective of Research

The objective of this research is to predict the most likely hidden state sequence of gold price.

1.5 Significance of Research

After the research was being done, it will give the significance benefit:

- a. Enrich the knowledge on the application of Hidden Markov Model in prediction field.
- b. Enrich the knowledge on the application of MATLAB as mathematical programming software.
- c. As a reference for further research especially in stochastic problem.

1.6 Systematic Writing of Thesis

Systematic writing of this thesis were stated as follows.

CHAPTER I INTRODUCTION

This chapter described about the background of the study that will be the fundamental theory, problem formulation, scope of research as the boundaries, objective of research as the aim, significance of research as the benefit and systematic writing.

CHAPTER II LITERATURE REVIEW

This chapter describes the explanation of the previous researches that have been conducted at earlier time about the

thesis. It also provides the literature study that the writer is using in the process of composing the thesis. The requirement process are being used to modelled this proposed method.

CHAPTER III RESEARCH METHODOLOGY

This chapter provides explanations that consist of the object of the research, model development, framework of research and necessary data that required in completing the research which is secondary data.

CHAPTER IV DATA COLLECTING AND PROCESSING

This chapter presents information of data that have been collected during the research. It also contains the problem solving using the proposed model or tools that are implemented in the data processing.

CHAPTER V DISCUSSION

This chapter provides a discussion about the data that has been collected during the research and also the result of processed data. Furthermore, it also discuss about the result to see the ability of proposed model to solve the problems.

CHAPTER VI CONCLUSION AND RECOMMENDATION

This chapter presents the conclusions of the research that conducted and recommendation for the further research.

REFERENCE

APPENDICES