

**STOCK PRICE FORECASTING
BY USING FUZZY INFERENCE SYSTEM**

A THESIS

Presented as Partial Fulfillment of the Requirements
Obtain the *Sarjana Ekonomi* (S1) Degree in Management Program
Faculty of Economics, Universitas Atma Jaya Yogyakarta



Compiled by:

Kintakaloka Trisetiawanto

Student ID Number: 081217455

**FACULTY OF ECONOMICS
UNIVERSITAS ATMA JAYA YOGYAKARTA
YOGYAKARTA**

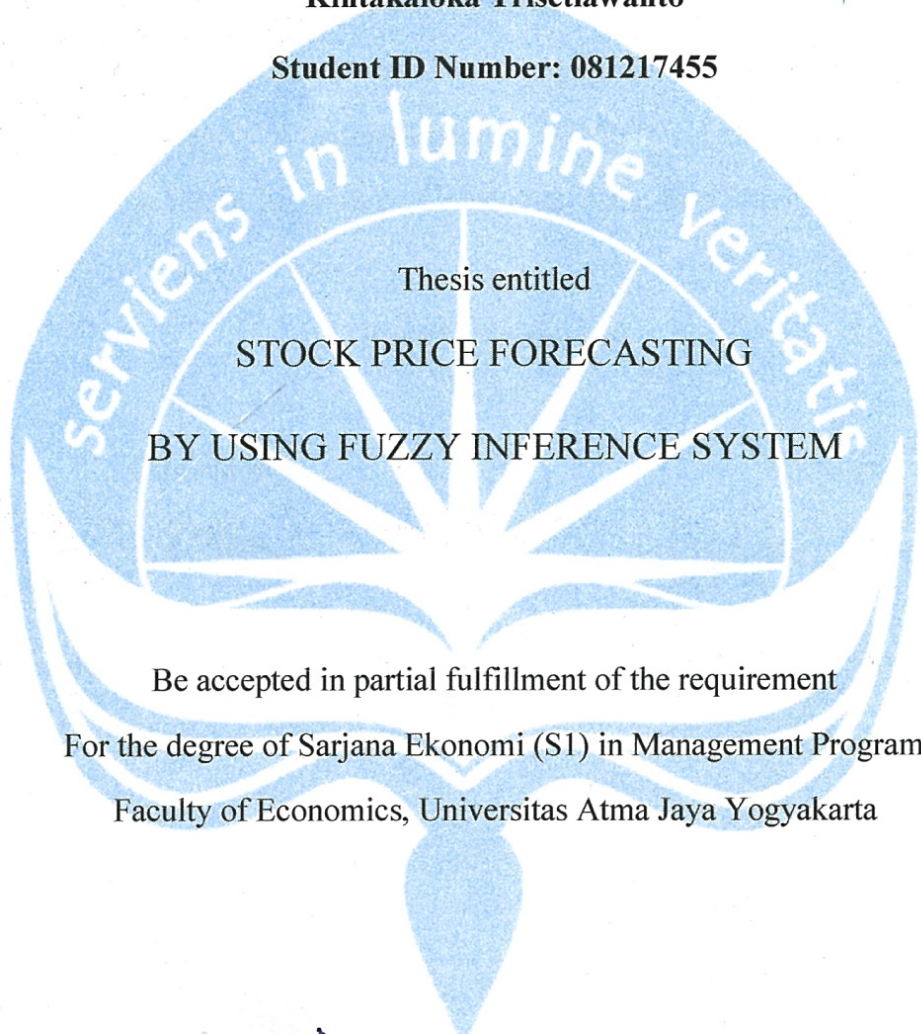
2011

Faculty of Economics
Universitas Atma Jaya Yogyakarta

I hereby recommended that the thesis prepared under my supervision by

Kintakaloka Trisetiawanto

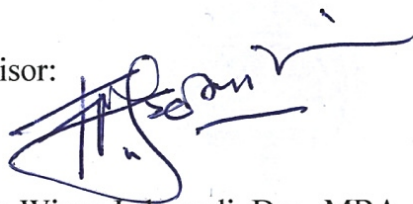
Student ID Number: 081217455



Thesis entitled
**STOCK PRICE FORECASTING
BY USING FUZZY INFERENCE SYSTEM**

Be accepted in partial fulfillment of the requirement
For the degree of Sarjana Ekonomi (S1) in Management Program
Faculty of Economics, Universitas Atma Jaya Yogyakarta

Advisor:



Felix Wisnu Isdaryadi, Drs., MBA.

Dated December 7th, 2011

This is to certify that the thesis entitled
STOCK PRICE FORECASTING
BY USING FUZZY INFERENCE SYSTEM

Compiled by:

Kintakaloka Trisetiawanto

Student ID Number: 081217455

Has been defended and accepted on 13 January 2012

Towards fulfillment of the requirement

For the degree of Sarjana Ekonomi (S1) in Management Program

Faculty of Economics, Universitas Atma Jaya Yogyakarta

Board of examiners

Chairman




Alexander Jatmiko W., S.E., SIP., MSF.

Members



Drs. Felix Wisnu Isdaryadi, MBA.



Th. Diah Widiastuti, S.E., M.Si.

Yogyakarta, 13 January 2012

Dean of Faculty of Economics



Dr. Dorothea Wahyu Ariani, SE., MT.

AUTHENTICITY ACKNOWLEDGEMENT

I, the writer of this thesis, entitled

“STOCK PRICE FORECASTING BY USING FUZZY INFERENCE SYSTEM”

Hereby declare that I fully knowledge that my writings does not contain others' or part(s) of others' writing, except for those that have been cited and mentioned in the references.

Yogyakarta December 7th, 2011



Kintakaloka Trisetiawanto

This Thesis Is Dedicated To:

My Lord Jesus Christ

My Beloved Family

My Special One

Heri "Hebch Sendiri" Family

Hagios Youth Fellowship

And All of my friends



ACKNOWLEDGEMENT

Thanks to the Lord Jesus Christ for his endurance blessing, mercy, and grace so that the author can resolve this thesis. Thanks for always brings me an opportunity, support and victory, so I can finished this writing and finished my study at Universitas Atma Jaya Yogyakarta.

This thesis was entitled “**STOCK PRICE FORECASTING BY USING FUZZY INFERENCE SYSTEM**”, compiled as fulfillment of the requirement for the degree of *Sarjana Ekonomi* (S1) in Management Program.

The writer realizes that there are many people whose had given their help and support within compilation of this thesis. Therefore, the writer is grateful for their contributions.

1. Mrs. Dr. Dorothea Wahyu Ariani, SE., MT. as the Dean of Economic Faculty, Universitas Atma Jaya Yogyakarta
2. Mr. Felix Wisnu Isdaryadi, Drs., MBA. as the Supervisor who has given so much time, power, thought, attention, guidance and advice for helping the writer to finish this thesis.
3. Mrs. Ernawati as a lecture who gave me an understanding about Fuzzy Inference System and also her support and her advice in order to make this thesis.

4. My Family, Daddy, Mommy, and both of my Sisters, Thank you for all your pray, love, and support. What should I be without all of you. Really-really love u all. Mwahh =*
5. My Special One, Joy Samantha Suwondo ^-^. Who support me and always cheering me up when I am down and depression. I know that Jesus brought you here, beside me as always to be my lil angel. Love u joyjoy.
6. All of Lecturers in Economic Faculty, Atma Jaya Yogyakarta University who has given their knowledge and shared their experience to writer during the study from the beginning until finishing this thesis.
7. Pojok Bursa, Economic Faculty, Atma Jaya Yogyakarta University and especially Mas Cosmas who has helped writer to collect the secondary data as well as shared anything about stocks.
8. Library of Atma Jaya Yogyakarta University and staffs, thank you for the books borrowed.
9. All of the Heri “Heboh Sendiri” family (Cebong, Agung, Sari, Vika, Ika, Viviea, Audi, Cezia, Inez, and Edwin) and also IBMP 08 family who can not be mentioned one by one, nice to have you. Friendship has no ends, and I will be missing you... (^-^)(づ)
10. International Staff, Mas Adit, who always keep me smile and support me whoever I am. Thank You mas adit, who always help me since in 1st semester. No wondering that u have a special place in heaven because of your kindness.

11. “Genjik Family” comm-cell who always encourage me, always make me happy and forget my pain and problem. Thank’s for your support guys!!
12. Hagios Youth Fellowship who always pray for me and care about me. Koh Andy, K’ Daru, Miseri, Irene, Euniq, Siska, Dodo, Karen, Eli, thank you for your pray to me. God Bless You all.
13. And other parties that writer can not mention one by one, thank you for all the help and support.

Even though there are many people, who helped the writer within compiling this thesis, but writer realizes that there is still much lack in this thesis. Therefore, writer will be pleased to get feedback from the readers. Thank you.

Yogyakarta, December 7th, 2011

Kintakaloka Trisetiawanto

TABLE OF CONTENTS

TITLE PAGE.....	i
APPROVAL PAGE	ii
COMMITTEE’S APPROVAL PAGE	iii
AUTHENTICITY ACKNOWLEDGEMENT	iv
DEDICATION PAGE.....	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	ix
LIST OF TABLES	xiii
LIST OF FIGURES.....	xiv
ABSTRACT	xv
CHAPTER I. INTRODUCTION	1
A. Research Background	1
1. Problem Statement	12
2. Scope of the Problem.....	12
3. Originality of the Research.....	13

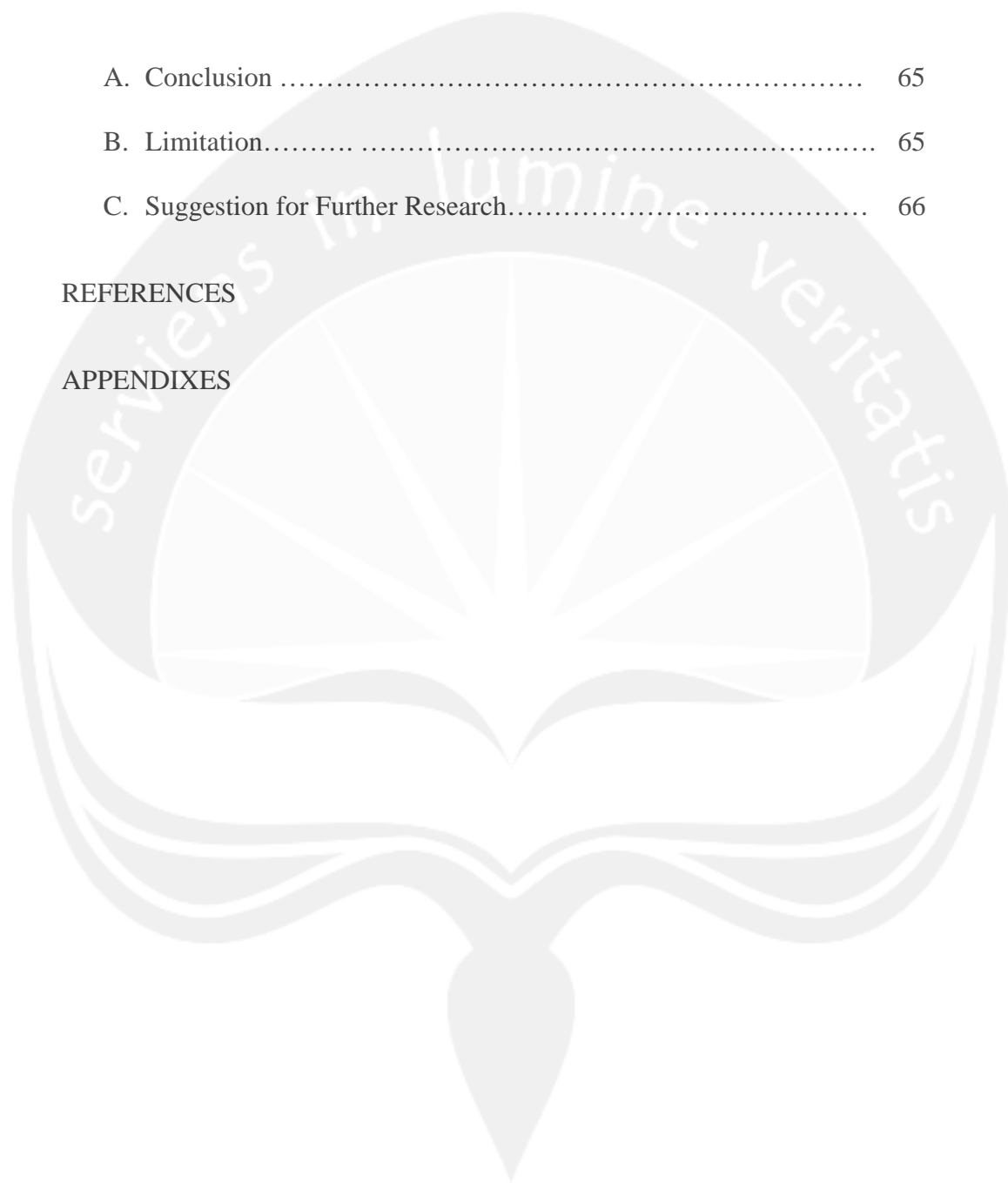
B.Objectives and Benefits of the Research	15
C.Research Report Outline	16
 CHAPTER II. THEORETICAL BACKGROUND AND PREVIOUS	
RESEARCH	17
A. Theoretical Background	17
1. Indonesian Stock Exchange	17
2. Closing Price	21
3. Dividend per Share.....	22
4. Fuzzy Inference System.....	22
5. Neuro-Fuzzy.....	22
6. Price to Earning Ratio.....	23
7. Trade Volume.....	23
8. Trapezodial Membership function.....	23
9. Triangular Membership function.....	24
10. Mean Absolute Deviation.....	25
11. Mean Square Error.....	25
12. Mean Absolute Percentage Error.....	26
13. Mean Percentage Error.....	26
14. Time Series Method.....	27
15. ANFIS.....	28
B. Previous Research	29
C. Hypothesis and Development	31

CHAPTER III. RESEARCH METODOLOGY	32
A. Sample.....	32
B. Data and Data Gathering	35
1. Data	35
2. Data Gathering	35
C. Variable and Variable Measurement	36
1. Variable.....	36
2. Variable Measurement.....	36
D. Analysis Tools	37
E. Method of Analysis and Hypothesis Testing	37
1. Method of Analysis	37
2. Hypothesis Testing	42
CHAPTER IV. DATA ANALYSIS	44
A. Research Description	44
B. Analysis Method.....	45
1. Crisp Input.....	46
2. Fuzzification.....	46
3. Reasoning.....	53
4. Deffuzification.....	58
5. Crisp Output Result.....	61

CHAPTER V. CONCLUSION.....	65
A. Conclusion	65
B. Limitation.....	65
C. Suggestion for Further Research.....	66

REFERENCES

APPENDIXES



LIST OF TABLES

Table 1	Table of Companies that always inLQ45 during 2000-2010.....	20
Table 2	Table of Assets.....	34
Table 3	Distribution of the Sample	34
Table 4	Table of Stock Price Fluctuation Quartile.....	47
Table 5	Table of Closing Price Quartile	48
Table 6	Table of Trade Volume Quartile.....	50
Table 7	Table of DPS Quartile.....	51
Table 8	Table of PER Quartile.....	52
Table 9	Table of the Rules.....	54
Table 10	Deffuzufication Sample.....	58
Table 11	Deffuzufication Result.....	60
Table 12	Table of Comparison among percent of real stock price fluctuation with percent of stock price fluctuation forecasting.....	61
Table 13	Table of Error Indexes.....	62
Table 14	MAPE Criteria.....	64

LIST OF FIGURES

Figure 1	Indonesian Capital Market Structure.....	3
Figure 2	TSK Reasoning Scheme	40
Figure 3	TSK Rule Evaluation.....	41
Figure 4	TSK Aggregation Rule Output.....	42
Figure 5	TSK Deffuzification.....	42
Figure 6	Stock Price Fluctuation Graph.....	48
Figure 7	Closing Price Graph.....	49
Figure 8	Trade Volume Graph.....	50
Figure 9	DPS Graph.....	51
Figure 10	PER Graph.....	52
Figure 11	Regression Estimation.....	54

**STOCK PRICE FORECASTING
BY USING FUZZY INFERENCE SYSTEM**

Compiled by:

Kintakaloka Trisetiawanto

Student ID Number: 081217455

Supervisor

Felix Wisnu Isdaryadi, Drs., MBA.

Abstract

This research is to establish a Fuzzy Inference System forecasting model to help the decision making process. In this research, the decision making is about decision making about stocks with the used of the historical data. The data used in this research are secondary data that consist of daily stock price fluctuation, daily closing price, daily trade volume, Price Earning Ratio and Dividend per Share and the name of companies listed in the LQ45 in the period of January 1st 2000 to December 31st 2010. The total sample is one company. For testing the model is performed by compare the real stock price fluctuation and forecasted stock price fluctuation. Every model has its limitation, called as an error. In this research, error is a differences between the real fluctuation compared with forecasting stock price fluctuation. In this research, to know whether the model is applicable or not, errors indexes used. Many errors indexes such as Mean Absolute Deviation, Mean Square Error, Mean Absolute Percentage Error, and Mean Percentage Error.

Keyword: Fuzzy Inference System, forecasting, stock price fluctuation, error indexes.