

Universiti Teknologi MARA

**Mathematical Model for Unemployment
in Malaysia using Dynamic Differential
Equation**

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STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.



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ABSTRACT

In this study, a mathematical model is developed using a dynamic differential equation by considering three variables which are the number of individuals who are unemployed, the number of individuals working and the number of new vacancies created by the government and private sectors. The paper analysed and evaluated the model of unemployment, the equilibrium point, stability of the equilibrium point and the characteristics of different variables on unemployment. The main objective of this study is to develop a Mathematical model for unemployment in Malaysia. This study also aims to pre-process the unemployment data set and to analyse the characteristics of unemployment using dynamic differential equation. The numerical simulation used was MAPLE. The first step was to find the equilibrium point. Then, the stability of the equilibrium was checked using the variational matrix. Next, the characteristics of unemployed persons were identified with respect to the rate of movement of employed people, x_2 , the rate of newly created vacancies by the government and private sector, α and the rate of unemployed person who starts their own independent work and become self-employment, x_5 . The result shows that the value of $\frac{dU^*}{d\alpha} < 0$. It means that if the number of newly created vacancies by the government and private sectors increases, then the rate of unemployment can be reduced. It is also shown that the equilibrium values of unemployed persons and the rate of self-employed are related. It also shows that the value of $\frac{dU^*}{dx_5} < 0$ which means if the rate of self-employed increases, then the rate of unemployment can be reduced.

Keywords: unemployed persons, mathematical model, employed persons, self-employment, newly created vacancies.

TABLE OF CONTENTS

CONTENTS	PAGE
SUPERVISOR'S APPROVAL	ii
DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF SYMBOLS	ix
CHAPTER ONE: INTRODUCTION	
1.1 Background of the Study	3
1.2 Problem Statement	3
1.3 Objective of the Study	4
1.4 Scope of the Study	4
1.5 Significance of the Study	4
CHAPTER TWO: LITERATURE REVIEW	
2.1 Introduction	5
2.2 Application of Dynamic Differential Equations	5
2.3 Method Used in Studying Unemployment	6
2.4 Previous Study using Dynamic Differential Equations	8
2.5 Summary	8
CHAPTER THREE: RESEARCH METHODOLOGY	
3.1 Introduction	9
3.2 Method of Data Collection	9

3.3	Method of Data Analysis	
3.3.1	Mathematical Model	10
3.3.2	Equilibrium Analysis	11
3.3.3	Stability Analysis	11
3.3.4	Characteristics of equilibrium values	16
3.3.5	Example of computation	20
CHAPTER FOUR: RESULTS AND DISCUSSIONS		
4.1	Introduction	21
4.2	Simulation	27
CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS		
5.1	Conclusions	29
5.2	Recommendations	29
REFERENCES		31
APPENDICES		35