UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

ANALYSIS OF GDP BASED ON VARIOUS GIA METHOD: A CASE STUDY OF MALAYSIA, THAILAND AND SINGAPORE

NUR MAISYUHADA BINTI MOHD IZZUDIN (2020476804)
INTAN MASTURA BINTI ZUBAIDI (2020878678)
NUR FATHIAH FATIN BINTI MOHAMAD FAUZI (2020898644)
(P03/M23)

Report submitted in partial fulfillment of the requirement
for the degree of
Bachelor of Science (Hons.) (Mathematics)
College of Computing, Informatics and Mathematics

AUGUST 2023

ACKNOWLEDGEMENTS

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

First and foremost, we would like to express our sincere gratitude to our supervisor, Puan Farah Azaliney binti Mohd Amin, for providing us with invaluable guidance and support throughout the entire project. Her continuous encouragement, insightful feedback, and patience have been instrumental in the successful completion of this project.

We would also like to thank our MSP660 lecturer, Dr. Zahari Md Rodzi, our friends and family for their incredible support and motivation throughout this project. Their kind words kept us focused and determined to achieve our goals.

Last but not least, we are deeply grateful and appreciate all those mentioned above and everyone else who has directly or indirectly contributed to this project. Their continuous support and assistance have been indispensable in bringing this project to fruition and we are truly grateful for their contributions.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS ..... **i**
TABLE OF CONTENTS ..... **ii**
LIST OF TABLES ..... **iv**
LIST OF FIGURES ..... **v**
ABSTRACT ..... **vi**
CHAPTER 1: INTRODUCTION **1**
1.1 Overview 1
1.2 Introduction 1
1.3 Problem Statement 4
1.4 Objectives 5
1.5 Significance and Benefit of Study 5
1.6 Scope and Limitation of Study 5
1.7 Definition of Terms 6
CHAPTER 2: BACKGROUND THEORY AND LITERATURE REVIEW **8**
2.1 Introduction 8
2.2 Grey System Theory 8
2.3 Grey Incidence Analysis 11
2.3.1 Application of Grey Incidence Analysis 12
2.3.2 Grey Incidence Analysis Method 13
2.4 Gross Domestic Product 14
CHAPTER 3: METHODOLOGY AND IMPLEMENTATION **20**
3.1 Overview 20
3.2 Framework of the study 20
3.2.1 Phase 1: Collect data from Refinitiv Eikon 21
3.2.2 Phase 2: Implementation 21
3.2.3 Phase 3: Calculate similarities and closeness 26
3.3 Numerical Findings 29
3.3.1 Absolute Degree of Grey Incidence Analysis 29
3.3.2 Relative Degree of Grey Incidence Analysis 32
3.3.3 Synthetic Degree of Grey Incidence Analysis 35
3.3.4 Grey Incidence Models Based on Similarity and Closeness 36
CHAPTER 4: RESULTS AND DISCUSSION **39**
4.1 The most influential factors on GDP during pre-COVID-19 39
4.2 The most influential factors on GDP during post COVID-19 40

4.3 Comparison the GDP performance using similarity and closeness 41
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS 48
REFERENCES 50
APPENDIX A 57
APPENDIX B 59

ABSTRACT

Gross Domestic Product (GDP) is considered as the most significant index of economic development. It measures the total value of goods and services produced within a country in a specific period. As the Coronavirus emerged in China starts at 2019 and expanded around the world, many nations implemented a range of measures, including lockdowns, travel restrictions, social distancing, testing, and economic support, to curb the spread of Coronavirus disease (COVID-19) and minimize its impact on economic activities. The challenge in this study is to identify the most influential factors on GDP when dealing with limited, incomplete, and uncertain data as well as complex patterns and relationships. The aim for this study is to identify the most influence factors on economic growth pre and post COVID-19. This study also analyzes the similarity and closeness of generalized Grey Incidence Analysis (GIA). Annual time series data for the 2011 to 2022 periods, GIA which are absolute, relative, and synthetic model used in this study. The factors on GDP used in this study are exports, imports, gross fixed capital investment, government consumption, consumer spending and inflation rates. All these factors are significant to GDP. The factor that has the highest synthetic degree will be considered as the most influential factor. As the results, the most influential factor during pre-COVID-19 for Malaysia are exports and inflation rates for Thailand and Singapore. However, after the pandemic, exports maintain as the main driving factor in Malaysia, while inflation rates continued to be the primary factor in Thailand, and gross fixed capital investment gained importance in Singapore. Singapore is similar to Malaysia than Thailand after pandemic for similarity and for the closeness, Thailand is closer to Malaysia than Singapore after pandemic. Based on the result, it is suggested to increase the sample size, add more variables and comparisons with other nations or regions, so may lead to improved economic research.