UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

RISK MINIMIZATION FOR A PORTFOLIO USING MEAN ABSOLUTE DEVIATION AND CONDITIONAL VALUE-AT-RISK

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ABSTRACT

This research focused on minimizing the risk of portfolios using mean-Mean Absolute Deviation (mean-MAD) and mean-Conditional Value-at-Risk (mean-CVaR) as mean-risk models. Since MAD and CVaR comes from different types of risk measure, they have different computational methods and hold onto different purposes. Hence, the question arises whether these two models can dominate either of them and which risk measure is efficient at minimizing risk. The first objective of this research is to minimize the risk of a portfolio using MAD and CVaR as risk measures. Then, this research wants to verify whether mean-MAD dominates mean-CVaR or vice versa and lastly, to compare which of the mean-risk model is more favourable based on the in-sample performance and out-sample realized performance. Scenario returns are simulated using the monthly returns of the 23 risky assets from FTSE Kuala Lumpur Composite Index (FBMKLCI) to construct the in-sample portfolios. The in-sample portfolios are then computed into the two (2) selected models to obtain the portfolio weights. From the in-sample analysis, we can see that MAD for CVaR-minimizing portfolios is not the lower MAD, and CVaR for MAD-minimizing portfolios is not the minimum CVaR. Hence, both mean-risk models does not dominates each other. Then, the in-sample portfolio performances are validated through out-of-sample analysis, using all 119 scenario returns in each out-of-sample portfolio. At the end of the result, MAD-minimizing portfolios give more favourable outcomes than CVaR since MAD gives higher expected realized returns than CVaR, and the CVaR for mean-MAD does not show much different from the optimal-CVaR. Thus, for the next research, it is recommended to use larger data sets obtained from various index using other available mean-risk models.

Contents

Acknowledgements **i**

Abstract **ii**

1 INTRODUCTION **1**

1.1 Overview 1

1.2 Research Background 1

1.3 Problem Statement 3

1.4 Objectives 4

1.5 Scope and Limitation 4

1.6 Definition of Terms and Abbreviations 5

1.7 Significance and Benefit of The Research 6

2 LITERATURE REVIEW **7**

2.1 Overview 7

2.2 Background of Portfolio Selection 7

2.3 Discussion on Mean Absolute Deviation and Conditional Value-at-Risk 9

2.4 Application of Methods 10

3 METHODOLOGY **12**

3.1 Overview 12

3.2 Data Collection and The Calculation of Monthly Returns 12

3.3 Construction of In-sample Portfolio 13

3.3.1 Mean-Mean Absolute Deviation (MAD) 14

3.3.2 Mean-Conditional Value-at-Risk (CVaR) 16

3.4 Validation of The Portfolio using Out-of-sample Analysis 19

4 COMPUTATIONAL RESULTS **21**
4.1 Overview 21
4.2 Collection of Data Sets 21
4.3 Analysis of The In-sample Portfolio 21
  4.3.1 Relationship between The Risk Level and The Target Return . 22
  4.3.2 Compositions of Portfolios 24
4.4 Out-of-Sample Analysis 26

5 CONCLUSION **29**

A Appendices of The In-Sample Analysis **31**

B Appendices of The Realized Risk and Returns **35**

References **37**