



The 16<sup>th</sup> National and International Conference  
"Global Goals, Local Actions: Looking Back and Moving Forward 2024"  
20 March, 2024

---

## The Construction of Optimal Portfolios of Traditional Investment and Alternative Investments

Thu Ta Naing

Email: Thuta.nain@bumail.net

Supachet Chansarn

Email: Supachet.c@bu.ac.th

### Abstract

This study investigates the factors of Portfolio Assets composition, Weights of Assets Allocation, and Investment Periods factors on constructing the Optimal Portfolios. Through the utilization of Markowitz's Modern Portfolio Theory, the Optimal Portfolios are discovered through the usage of official past Secondary Data sources, as well as Computer-Aided Linear Problem-Solving Techniques. 5 Assets, namely, SET Stocks, Bonds, Gold, Real Estate and Bitcoin, are considered in a variety of asset combinations to construct the Efficient Frontier Curve and optimal Portfolio combinations. According to the findings, the best optimum portfolio so far, is the 5-Assets combination of Portfolio over the 10-year Investment Timeframe, with the Sharpe Ratio of 6.245, with assets weight allocations of 20.6% Stocks, 24.4% Bonds, 53.7% Real-Estate Shares, and 1.3% Bitcoin. Moreover, the two Investment timeframes (5 Year Period and 10 Year Period) are both considered and compared with each other to give insights on best possible timeframe to consider. The result is the longer 10-Year timeframe, as the returns are more smoothed as well as exhibiting less risk and higher expected return.

**Keywords:** Optimal Portfolios, Investment Finance, Modern Portfolio Theory, Thailand Capital Markets, SET, Efficient Frontier

### Introduction

The thesis study highlights the importance of Markowitz's Modern Portfolio Theory Approach in constructing the Optimal Portfolios Harry M. Markowitz. (2011). Based on current literature analysis, there is currently a research gap in Portfolios construction on a mix of Thailand Capital Markets and Alternative Assets: ABDELMALAK, Y. (2017), Rhoads, D. (2021), Kong-ied, A. (2017). The author considered the usage of 5 Assets, two of which are traditional

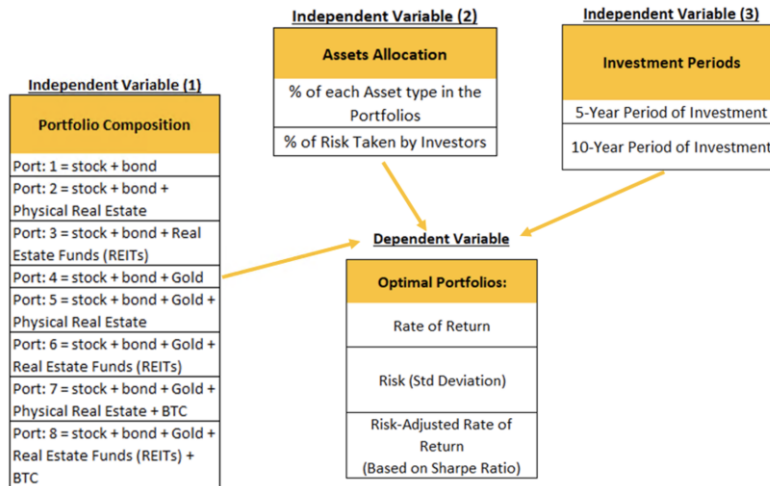






The 16<sup>th</sup> National and International Conference  
 "Global Goals, Local Actions: Looking Back and Moving Forward 2024"  
 20 March, 2024

Conceptual Framework



Literature Review

In this chapter, the theories of relevant topics and previous studies are discussed.

No.	Academic (Year Published)/Findings	Details
1	Frontier_Investment_Management (2018)	The research defines Alternative assets play the important role in improving investment performance, as the Top US Endowment Funds add up to 50% in their portfolios
2	The Analysis on Portfolio Performance Consisting of Several Asset Classes and Different Portfolio Rebalancing Policies (2018)	The article emphasizes the Modern Portfolio Construction using Govt & Corporate Bonds, Thai Equities, Global Equities and Property Funds, with the basement of 1 Year Investment historical data. Emphasis is placed on the application of Markowitz's theory with Rebalancing Techniques in the short-term period.
3	Practical Application of Modern Portfolio Theory (2013)	The article proved that Markowitz's theory proved to be more effective in long-term investment period, while the market needs to be in moderate efficient form.
4	The Application of the Markowitz's Model in Efficient Portfolio Forming on the Capital Market in the Republic of Serbia (2018)	The research revealed that in emerging countries, Markowitz's theory had limitations to the extent that only Liquid stocks will result in Efficient Portfolios, while the related Serbian Market exhibits the illiquidity issues, thus quite resulting in applying the theory difficult.
5	Markowitz (2011)	Sharpe Ratio and Efficient Frontier



The 16<sup>th</sup> National and International Conference  
"Global Goals, Local Actions: Looking Back and Moving Forward 2024"  
20 March, 2024

---

## Methodology

This chapter presents the important aspects of this study, in which it explains how the research was designed, the methods used, explained in step-by-step procedure. It also discusses challenges and scope of the findings in this study. This chapter highlights the step-by-step procedure, providing a clear process on how the Optimal Portfolios were constructed. They are as follows:

- Step 1: Calculate Returns and Risk of Each Single Asset
- Step 2: Examine The Relationship Between a Pair of Assets.
- Step 3: Calculate Portfolio Return and Risk
- Step 4: Construct Efficient Frontier
- Step 5: Calculate The Optimal Combination of Assets in Portfolios
- Step 6: Compare Efficient Frontier and The Optimal Combination of Assets in Portfolio

Additionally, Four Hypotheses are proposed in this section, which will be later proved to be accepted or rejected in next chapter.

## The Research Procedure

There are 4 stages in the research procedure for this study. First, the researcher will research the previous Portfolios research done by other researchers and any research gaps, academic journals, academic books, and related theories. This study started in August 2023. Secondly, the secondary data sources are collected from the institutions stated below. Thirdly, based on Methodology Section, the following are conducted: Assets Performance, Correlation and Covariance matrix, Optimal Weight Allocations, Efficient Frontiers of total 16 Portfolios proposed. This analysis started in October 2023. Fourthly, Performance Comparisons are conducted, and proposed hypotheses are proven to be accepted or rejected. This analysis started in December 2023.

## Data Collection

All the data sources utilized in this study is based on official secondary sources, listed as follows:





The 16<sup>th</sup> National and International Conference  
"Global Goals, Local Actions: Looking Back and Moving Forward 2024"  
20 March, 2024

.....

deviation, increased diversification, and higher Expected Return. 5-Asset Portfolio of 20.6% Stocks, 24.4% Bonds, 53.7% Real-Estate Shares, 1.3% Bitcoin achieved the highest Sharpe Ratio of 6.245 among the totals constructed. The Risk-Adjusted Return is 55.01% and Risk is 8.33%.

However, regarding the 5-Year Investment Period, 5-Assets Portfolio of 23% Stocks, 18.9% Gold, 57.1% Real-Estate Shares, 0.9% in Bitcoin, achieved the highest Sharpe Ratio of 4.38. Investors who seek for short-term 5 Year period only should adapt to this investment allocation strategy. The Risk-Adjusted Return is 51.77% and Risk is 11.14%.

Additionally, regarding the 10-Year Period, 5-Assets Portfolio of 20.6% Stocks, 24.4% Bonds, 53.7% Real-Estate Shares, 1.3% Bitcoin, achieved the highest Sharpe Ratio, which is also the same as the previous best optimal portfolios among the totals.

**Null Hypothesis 1:** Traditional Portfolio with ONLY stocks and bonds exhibits the lower return and risk than the Active Portfolios with alternative assets. **(REJECTED)**

Traditional portfolios achieve the lowest Sharpe ratio 1.916 (5-Yr) and 2.750 (10-Yr).

**Null Hypothesis 2:** Portfolio with the most assets exhibit the highest risk adjusted rate of return (Sharpe Ratio) **(REJECTED)**

There are some fewer asset portfolios achieving better returns than higher assets.

**Null Hypothesis 3:** Return and risk from 5-year portfolio are higher than those from 10-year portfolio. **(REJECTED)**

The findings revealed that long-term 10-year portfolio achieves higher returns than lower 5-year term.

**Null Hypothesis 4:** The inclusion of Bitcoin does not offer Risk-Adjusted Rate of Return (i.e., Sharpe Ratio) in the Portfolios **(REJECTED)**

Although Bitcoin exhibits extreme volatility, the inclusion of this asset improves the returns, and higher Sharpe Ratio.

## Conclusion

The ultimate objective of this research is to discover the new opportunities for investment in Thai capital markets with a list of other alternative assets readily available. This is very beneficial for investors who are interested in exploring new opportunities on such investments, but still do not have the correct guidance to do so. In this research study, a variety of portfolio mixtures were constructed and compared, and identify which could be





The 16<sup>th</sup> National and International Conference  
"Global Goals, Local Actions: Looking Back and Moving Forward 2024"  
20 March, 2024

.....

Rhoads, D. (2021). *murraystate*. Using Modern Portfolio Theory To Create Efficient Portfolios From S&P500. from  
<https://digitalcommons.murraystate.edu/cgi/viewcontent.cgi?article=1101&context=onorstheses>.

Sae-ue, R. M. (2018). *The Analysis on Portfolio Performance Consisting of Several Asset Classes and Different Portfolio Rebalancing Policies*.

thaibma.or.th. (2023). *Thai BMA*. from  
<https://www.thaibma.or.th/EN/Market/Index/BondIndex.aspx>.