ORIGINAL PAPER

Factors Affecting the Stock Return: In Case of Study Technology Industry Sector

Pattama Komenjumrus* and Supawadee Hamanee

School of Business Administration Sripatum University, Bangkok, Thailand

*Corresponding author: *pattama.spu@gmail.com*

Received: 26 February 2025 / Revised: 05 April 2025 / Accepted: 07 April 2025

Abstract: The objective of this study is to examine the relationship between factors influencing stock returns in the technology industry, classified by market capitalization into three groups: small-cap, mid-cap, and large-cap securities. The study covers the period from January 2021 to December 2024. The findings indicate that the market return is positively correlated by 100% with the returns of securities in the technology industry across all three categories: small-cap, mid-cap, and large-cap securities. In addition, it was found that the return of the Dow Jones index and exchange rates have a greater impact on the stock returns of large-cap technology securities than on those of small-cap and mid-cap securities.

Keywords: Return, Securities, Technology

1. Introduction

Currently, the technology industry plays a crucial role in driving Thailand's economy and society in the digital era. It enhances production efficiency, reduces production costs, improves operational performance, and creates growth opportunities in the online and e-commerce markets. Moreover, technology boosts competitiveness, as businesses that adopt technological innovations can quickly adapt to market changes and foster innovation. Technology also aids in big data analysis, enabling businesses to make precise and efficient decisions. Furthermore, technology contributes to the development of social and life quality. In healthcare, it enhances the accuracy and speed of disease diagnosis and treatment. In education, technology provides online learning platforms, making education more accessible and flexible. Another important aspect that cannot be overlooked is how technology strengthens security and risk management. The development of security technologies helps prevent cyberattacks and digital threats. From the importance mentioned above, it can be seen that the technology industry is a key factor driving the development of Thailand's economy and society in the digital era. Efficient use of technology helps enhance competitiveness and improve the quality of life for citizens. It also leads to increased investment in the technology sector, which is reflected in the stock trading activity on the Stock Exchange of Thailand. In 2015, there were 32 technology-sector securities traded, and by 2024, this number had risen to 44 securities. This represents an increase of nearly 40% in trading of technology-sector securities in 2024 compared to 2015. Therefore, studying investment in technology-sector securities is crucial and cannot be overlooked. In this research, we aim to examine factors affecting the stock return: in case of study technology industry sector.

1.1 Research Objectives

The objective of this research is to examine the relationship between factors influencing stock returns in the technology industry from January 2021 to December 2024. The study will classify the securities based on market capitalization into three groups: small-cap, mid-cap, and large-cap securities.

1.2 Research Hypothesis

The return rate of the market return, crude oil futures prices, exchange rates, inflation rates, and the return rate of the Dow Jones index influence the return rate of securities in the technology industry.

1.3 Theoretical Concepts

The theoretical framework used in this study includes the following concepts: (1) The Concept of Return and Risk (2) The Concept of Fundamental Factors (3) The Concept of Security Groups

1.3.1 The Concept of Return and Risk

- The Concept of Return
  The return on securities can be analyzed as follows:
  The return on a security is typically calculated using the following formula:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where R_t refers to The daily return of each security in the technology sector on the Stock Exchange of Thailand

P_t refers to the closing price of the security on the current day

P_{t-1} refers to the closing price of the security on the previous day

- The Concept of Measuring RiskThe Concept of Measuring Risk**.** It can be analyzed as follows.

$$\sigma^2 = \frac{\sum_{t-1}^{n}\left(R_{it} - R_i\right)^2}{n-1}$$

Where σ^2 refers to The variance of the return on investment in securities

σ refers to The standard deviation of the return on investment in securities

R_{it} refers to The return on security i during time period t

$\bar{R}_i$ refers to The average return of a security

n refers to the number of historical data points of the security

1.3.2 The Concept of Fundamental Factors

The fundamental factors used in this study include the market return rate, inflation rate, exchange rate, crude oil futures prices, and the return rate of the Dow Jones index.

1.3.3 The Concept of Security Groups

The concept of grouping securities will be based on market capitalization. Securities in the technology sector will be ranked by market capitalization, from smallest to largest. The top 30% with the highest market capitalization will be classified as large-cap securities, the next 40% will be classified as mid-cap securities, and the bottom 30% with the lowest market capitalization will be classified as small-cap securities

1.3 Research Framework

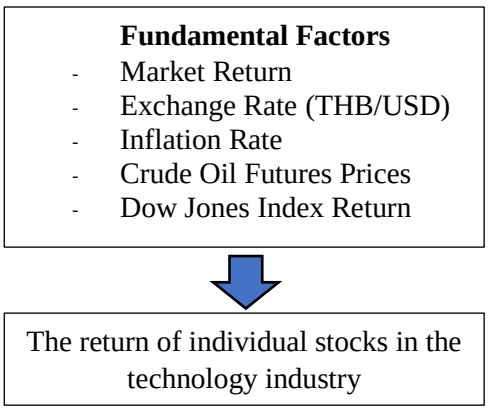

Figure 1: Research Framework

1.4 Scope and Data Used in the Study

This research utilizes secondary data on securities that were actively traded between December 30, 2020, and December 30, 2024. The data sources are as follows:

- Market return and stock return data for the technology industry sector are collected from the Stock Exchange of Thailand (SET) on a daily basis.
- Dow Jones Index return data and crude oil futures prices are obtained from Investing.com.
- Inflation rate data is collected from Trade Policy and Strategy Office.
- Exchange rate data is sourced from the Bank of Thailand.

2. Materials and Methods

2.1 Model Used in the Study

$$R_{it} = \beta_1 Infla_t + \beta_2 Oil_t + \beta_3 Djone_t + \beta_4 Exch_t + \beta_5 SET_t + e_t$$

Where $Infla_t$ refers to Inflation Rate
Oil_t refers to Crude Oil Futures Prices
$Djone_t$ refers to Dow Jones Index Return
$Exch_t$ refers to Exchange Rate
R_SET_t refers to Stock Market Return
e_t refers to Error term

2.2 The steps for conducting research are as follows:

In conducting the research, the following research steps are carried out:

- Data Collection: Collect data for various variables from secondary sources, including market returns, stock returns for the technology industry group, Dow Jones index returns, crude oil futures prices, inflation rates, and exchange rates.
- Stock Grouping: Classify technology stocks into three groups: small-cap stocks, mid-cap stocks, and large-cap stocks.
- Test for Stationarity: Test the stationarity of data for all variables. For non-stationary data, apply the First Differencing method to adjust the data. For stationary data, use it to determine relationships in Multiple Regression. The stationarity test in this study will use the Phillips-Perron (PP) method, which can be performed using the following regression equation:

$$\Delta Y = \alpha + \beta Y_{t-1} + \varepsilon_t$$

Where ΔY refers to the changes in stock returns and the fundamental factor variables.
Y_{t-1} refers to Stock returns and fundamental factor variables at time t-1
α refers to Constant term
β refers to Time trend coefficient.
ε_t refers to Error term

The hypotheses used for testing the Phillips-Perron (PP-Test) are as follows:

H_0: The time series data of the variable under study at time t is non-stationary.

H_1: The time series data of the variable under study at time t is stationary.

- Estimate the regression equation to determine the relationship between the fundamental factors and stock returns for individual stocks in the technology group.
- Test for multicollinearity among independent variables to examine whether the model includes independent variables that are correlated with each other. This will be done using the Variance Inflation Factor (VIF) method. The VIF calculation formula is as follows:

$$VIF = 1/(1-R^2)$$

If the VIF value is 10 or higher, it indicates a multicollinearity problem. To

address multicollinearity, the following approaches can be used:

1) Select variables that are important and do not have high correlations with each other to include in the model.
2) Increase the sample size to reduce the standard error of the coefficient estimates, which will improve the accuracy of the regression model's estimated coefficients.

- Test for autocorrelation: Autocorrelation issues often arise in time series data. In this study, autocorrelation can be tested using the Breusch-Godfrey Serial Correlation LM Test. The testing procedure is as follows:

  H_0: The error terms are not correlated.
  H_1: The error terms are correlated.

  From the hypothesis, if H_0 is accepted, it indicates that there is no autocorrelation problem. On the other hand, if H_1 is accepted, it indicates the presence of autocorrelation.

To address this issue, the Newey-West standard errors method can be applied to correct for autocorrelation in the model.

3. Results

The study on the factors influencing stock returns in the technology industry group during the period 2021-2024 can be summarized as follows: The study results on the factors influencing stock returns in the technology industry group are as follows:

Impact of Various Factors on Stock Returns in the Small Technology Industry Group (Table 1)

1) Inflation Rate (Infla_t): Inflation influences stock returns in the small technology industry group by 30%, all positively. The stock with the highest positive coefficient is ICN, while SVOA has the lowest. This suggests that when inflation rises, a depreciation of the Thai baht leads to higher stock returns in this group.
2) Crude Oil Futures Prices (Oil_t): Crude oil futures prices affect stock returns by 30%, all negatively. The stock with the highest negative coefficient is MFEC, while ICN has the lowest. This indicates that as crude oil prices increase, production costs rise, leading to lower stock returns in this group.
3) Dow Jones Index Return (Djone_t): This factor does not significantly impact stock returns in the small technology industry group.
4) Stock Market Return (R_SET_t): Market return affects stock returns by 100%, all positively. The stock with the highest positive coefficient is SDC, while PT has the lowest. This shows that as overall market returns increase, stock returns in this group also rise proportionally.
5) Exchange Rate (Exch_t): The exchange rate does not significantly impact stock returns in the small technology industry group

Impact of Various Factors on Stock Returns in the Medium Technology Industry Group (Table 2)

1) Inflation Rate ($Infla_t$) It was found that this factor affects the stock returns in the mid-sized technology industry group by 7.14%, positively, including the stock SAMTEL. This indicates that when the exchange rate factor positively impacts stock returns, a depreciation of the Thai baht leads to higher returns for securities in this group.
2) Crude Oil Futures Prices (Oil_t) This factor affects stock returns in the medium-sized technology industry

Table 1: Study Results of Stock Returns in the small-cap Technology Industry Group.

Impact	Small-cap stock group.				
	$Infla_t$	Oil_t	$Djone_t$	R_SET_t	$Exch_t$
Positive impact.	3	0	0	10	0
Negative impact.	0	3	0	0	0
All affected securities.	3	3	0	10	0
All tested securities.	10	10	10	10	10
The percentage with a statistically significant impact.	30	30	0	100	0
The highest positive coefficient.	.4424111** ICN		-	1.844152*** SDC	-
The lowest positive coefficient.	.3548443** SVOA		-	.5513847*** PT	-
The highest negative coefficient.		-.0130295** MFEC	-	-	-
The lowest negative coefficient.		-.0169075** ICN	-	-	-

Note: *** It means that the effect is statistically significant at the 0.01 level.
** It means that the effect is statistically significant at the 0.05 level.
* It means that the effect is statistically significant at the 0.10 level.

Table 2: Study Results of Stock Returns in the Mid-cab Technology Industry Group.

Impact	Mid-cap stock group.				
	$Infla_t$	Oil_t	$Djone_t$	R_SET_t	$Exch_t$
Positive impact.	1	0	0	14	1
Negative impact.	0	3	0	0	2
All affected securities.	1	3	0	14	3
All tested securities.	14	14	14	14	14
The percentage with a statistically significant impact.	7.14	21.43	0	100	21.43
The highest positive coefficient.	.2712456* SAMTEL		-	1.704481*** SYNEX	1.12668** ROCTEC
The lowest positive coefficient.	.2712456* SAMTEL		-	.8432938*** HUMAN	1.12668** ROCTEC
The highest negative coefficient.	-	-.0130204* ITEL	-	-	-.816118* HUMAN
The lowest negative coefficient.	-	-.0153295** SYNEX	-	-	- 1.586991*** SVI

Note : *** It means that the effect is statistically significant at the 0.01 level.
** It means that the effect is statistically significant at the 0.05 level.
* It means that the effect is statistically significant at the 0.10 level.

group by 21.43% in a negative direction. The stock with the highest negative coefficient is ITEL, while

the stock with the lowest negative coefficient is SYNEX. When the price of oil futures rises, it increases the cost of goods, which subsequently leads to a decrease in stock returns for this group.

3) Dow Jones Index Return ($Djone_t$) This factor does not affect stock returns in the medium-sized technology industry group.
4) Stock Market Return (R_SET_t) This factor affects stock returns in the medium-sized technology industry group by 100% in a positive direction. The stock with the highest positive coefficient is SYNEX, while the stock with the lowest positive coefficient is HUMAN. In other words, when the stock market return increases, the returns for all stocks in this group also increase.
5) Exchange Rate ($Exch_t$) This factor impacts stock returns in the medium-sized technology industry group by 21.43%, both positively and negatively. The positive effect is observed in ROCTEC, which indicates that when the Baht depreciates, stock returns for this group increase. Conversely, the factor negatively affects stock returns, with HUMAN having the highest negative coefficient and SVI the lowest.

Impact of Various Factors on Stock Returns in the Large Technology Industry Group (Table 3)

1) Inflation Rate($Infla_t$) It was found that the mentioned factors impact stock returns in the large technology industry sector by 30%, both positively and negatively. Regarding the inflation factor that affects stock returns positively, there are two stocks. The stock with the highest positive coefficient is 3BBIF, while the stock with the lowest positive coefficient is DIF. This means that when the Thai Baht depreciates, stock returns increase. Conversely, the inflation factor has a negative impact on stock returns for one stock, namely DELTA, where the depreciation of the Baht leads to a decrease in stock returns.
2) Crude Oil Futures Prices (Oil_t) It was found not to impact stock returns in the large technology industry sector.
3) Dow Jones Index return ($Djone_t$) it was found to affect stock returns in the large technology industry sector by 20%, both positively and negatively. The factor of the Dow Jones Index return that impacts stock returns positively is the stock DIF,meaning that when the Dow Jones Index return increases, stock returns also rise. In contrast, the factor has a negative impact on stock returns for ADVANC, meaning that when the Dow Jones Index return increases, stock returns decrease.
4) Stock Market Return (R_SET_t) it was found to affect stock returns in the large technology industry sector 100% positively. The stock with the highest positive coefficient is DELTA, and the stock with the lowest positive coefficient is 3BBIF. This means that when the market return factor increases, stock returns for all stocks in the sector increase.
5) Exchange Rate ($Exch_t$) it was found that this factor affects stock returns in the large technology industry sector 40% positively and negatively. The factor that impacts stock returns positively is ADVANC, meaning that when the Baht depreciates, stock returns for this stock increase. Conversely, the factor leads to a decrease in stock returns for KCE, the stock with the highest negative

coefficient, while DELTA has the lowest negative coefficient

4. Discussion and conclusions

The results of the study conducted above are consistent with another research as follows:

4.1 Inflation Rate

The research by Pattama Komenjumrus (2019) on "Factors Affecting the Stock Return in Each Security in the Stock Exchange of Thailand: In Case of Study SET100" found that inflation affects the stock returns in the SET100 group.

The research by Saranya Trakulpaisan and Sirikwan Jaroenworiyakul (2023) on "Factors Affecting the Rate of Return of Energy and Utility Securities in the Stock Exchange of Thailand" found that the Consumer Price Index influences the stock returns in the energy and utility sectors.

The research by Apichaya Supasoon and Massaporn Cheuathonghua (2023) on "Factors Influencing the Total Return of Property Funds and Trusts" found that the general Consumer Price Index has an inverse influence on the rate of return of real estate investment trusts at a statistical significance level of 0.01.

The research by Phungphech Phusi (2017) on "The Factors Affecting the Energy Sector Index in the Stock Exchange of Thailand" found that inflation has a statistically significant negative correlation with the Energy Sector Index in the Stock Exchange of Thailand.

Table 3: Study Results of Stock Returns in the large-cap Technology Industry Group

Impact	**Large-cap stock group**				
	$Infla_t$	Oil_t	$Djone_t$	R_SET_t	$Exch_t$
Positive impact.	2	0	1	10	1
Negative impact.	1	0	1	0	3
All affected securities.	3	0	2	10	4
All tested securities.	10	10	10	10	10
The percentage with a statistically significant impact.	30	0	20	100	40
The highest positive coefficient.	.1274157* 3BBIF	-	.0044583*** DIF	2.524478*** DELTA	.3975217** ADVANC
The lowest positive coefficient.	.118204** DIF	-	.0044583*** DIF	.3965104*** 3BBIF	.3975217** ADVANC
The highest negative coefficient.	-.4388588* DELTA	-	-.0043193*** ADVANC	-	-1.072548** KCE
The lowest negative coefficient.	-.4388588* DELTA	-	-.0043193*** ADVANC	-	-1.508121** DELTA

Note : *** It means that the effect is statistically significant at the 0.01 level.
** It means that the effect is statistically significant at the 0.05 level.
* It means that the effect is statistically significant at the 0.10 level.

4.2 Crude Oil Futures Prices

The research by Saranya Trakulpaisan and Sirikwan Jaroenworiyakul (2023) on "Factors Affecting the Rate of Return of Energy and Utility Securities in the Stock Exchange of Thailand" found that crude oil futures prices affect the stock returns in the energy and utility sectors.

The research by Phungphech Phusi (2017) on "The Factors Affecting the Energy Sector Index in the Stock Exchange of Thailand" found that crude oil futures prices have a

statistically significant positive correlation with the Energy Sector Index in the Stock Exchange of Thailand. The research by Nantarat Ruxariyatham (2011) on "Relationships between Economic Factors and Industry Stock Indices" found that Oil Futures Price affects the stock index of the technology sector.

4.3 Dow Jones Index Return

From the review of previous research, it was found that the Dow Jones Index return affects the returns of securities. This finding is consistent with the research of Saranya Trakulpaisan and Sirikwan Jaroenworiyakul (2023) on "Factors Affecting the Rate of Return of Energy and Utility Securities in the Stock Exchange of Thailand," which found that the Dow Jones Index return affects the stock returns in the energy and utility sectors. It is also in line with the research of Supitcha Temtarnthip on "The Effectiveness of Economic Factors on the Stock Price in the Technology Industry: Information and Communication Technology Sector During Covid-19," which found that the Dow Jones Index return is correlated with the stock prices of the information and communication technology sector during the Covid-19 pandemic.

4.4 Stock Market Return

The research by Pattama Komenjumrus (2019) on "Factors Affecting the Stock Return in Each Security in the Stock Exchange of Thailand: In Case of Study SET100" found that Stock Market Return affects the stock returns in the SET100 group.

The research by Saranya Trakulpaisan and Sirikwan Jaroenworiyakul (2023) on "Factors Affecting the Rate of Return of Energy and Utility Securities in the Stock Exchange of Thailand" found that Stock Market Return affects the stock returns in the energy and utility sectors.

The research by Phungphech Phusi (2017) on "The Factors Affecting the Energy Sector Index in the Stock Exchange of Thailand" found that Stock Market Return is correlated with the Energy Sector Index in the Stock Exchange of Thailand.

The research by Supitcha Temtarnthip (2021) on "The Effectiveness of Economic Factors on the Stock Price in the Technology Industry: Information and Communication Technology Sector During Covid-19" found that Stock Market Return is correlated with the stock index in the information and communication technology sector.

4.5 Exchange Rate

The research by Pattama Komenjumrus (2019) on "Factors Affecting the Stock Return in Each Security in the Stock Exchange of Thailand: In Case of Study SET100" found that exchange rates affect the stock returns in the SET100 group.

The research by Saranya Trakulpaisan and Sirikwan Jaroenworiyakul (2023) on "Factors Affecting the Rate of Return of Energy and Utility Securities in the Stock Exchange of Thailand" found that exchange rates affect the stock returns in the energy and utility sectors.

The research by Apichaya Supasoon and Massaporn Cheuathonghua (2023) on "Factors Influencing the Total Return of Property Funds and Trusts" found that exchange rates affect the returns of real estate investment funds.

The research by Phungphech Phusi (2017) on "The Factors Affecting the Energy Sector Index in the Stock Exchange of Thailand" found that exchange rates are correlated with the Energy Sector Index in the Stock Exchange of Thailand.

Acknowledgments

I would like to express my sincere gratitude to everyone who contributed to the successful completion of this research. My heartfelt Supasoon A, Cheuathonghua M (2023) Factors influencing the total return of property funds and trusts. Proceedings of the 24th National Graduate Conference (2/2023), May 2023, Command and General Staff College, Thailandthanks go to the administrators of Sripatum University for their academic support. I am also deeply grateful to my family and friends for their constant encouragement throughout this journey. Lastly, I would like to thank all those who played a part in helping me achieve the goals of this research with my deepest appreciation.

References

Bank of Thailand (2025) Exchange rate. Retrieved January 6, 2025, from https://app.bot.or.th/BTWS_STAT/statistics/BOTWEBSTAT.aspx?reportID=123&language=TH

Investing.com Ltd (2025) Crude oil futures contract. Retrieved January 6, 2025, from https://th.investing.com/commodities/crude-oil-historical-data

Investing.com Ltd (2025) Dow Jones Index. Retrieved January 6, 2025, from https://th.investing.com/indices/us-30-historical-data

Komenjumrus P (2019) Factors affecting the stock return in each security in the Stock Exchange of Thailand: A case study of SET100. Master's thesis, King Mongkut's University of Technology Thonburi, p 28

Phusi P (2017) Factors affecting the energy sector index in the Stock Exchange of Thailand. Master's thesis, University of Thai Chamber of Commerce, p 38

Ruxariyatham N (2011) Relationships between economic factors and industry stock indices. Master's thesis, Thammasat University, p 45

Sangkaew J (2004) Investment. (6th ed.) Thammasat University.

Supasoon A, Cheuathonghua M (2023) Factors influencing the total return of property funds and trusts. Proceedings of the 24th National Graduate Conference (2/2023), May 2023, Command and General Staff College, Thailand.

Temtarnthip S (2021) The effectiveness of economic factors on stock prices in the technology industry: Information and communication technology sector during Covid-19. Master's thesis, Thammasat University, p 34

The Stock Exchange of Thailand (2025) Securities price. Retrieved January 6, 2025, from https://www.setsmart.com/ssm/login

Trade Policy and Strategy Office (2025) Inflation rate. Retrieved January 6, 2025, from https://tpso.go.th/economic-data/consumer-price-index

Trakulpaisan S, Jaroenworiyakul S (2023) Factors affecting the rate of return of energy and utility securities in the Stock Exchange of Thailand. Proceedings of the 25th National Graduate Conference (2/2023), 3 July 2023, Sripatum University, Thailand