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Return Performance of Indonesian Technology Stocks: A Descriptive Analysis of Post-Pandemic Market Dynamics (2023–2025)

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Abstract: : *This study aims to describe and compare the return performance of technology-related stocks listed on the Indonesia Stock Exchange during the period January 2023–December 2025. This research applies a descriptive quantitative approach using secondary data in the form of monthly stock returns calculated from monthly closing stock prices. The research sample consists of eight technology-related companies, namely GoTo Gojek Tokopedia Tbk. (GOTO), Bukalapak.com Tbk. (BUKA), DCI Indonesia Tbk. (DCII), Elang Mahkota Teknologi Tbk. (EMTK), M Cash Integrasi Tbk. (MCAS), Distribusi Voucher Nusantara Tbk. (DIVA), Kioson Komersial Indonesia Tbk. (KIOS), and Solusi Sinergi Digital Tbk. (WIFI). The data were analyzed using descriptive statistics consisting of mean, minimum, maximum, and standard deviation. The results show heterogeneous return characteristics among Indonesian technology stocks. WIFI recorded the highest average monthly return, followed by DCII and KIOS. Meanwhile, MCAS recorded the lowest average monthly return. In terms of volatility, KIOS showed the highest standard deviation, while BUKA had the lowest standard deviation. These findings indicate that Indonesian technology stocks have diverse risk-return profiles across companies. This study provides an empirical descriptive overview of technology stock performance in Indonesia after the pandemic and after major digital company IPOs. This study contributes to the literature by providing an updated descriptive mapping of risk-return characteristics among Indonesian technology stocks during the post-pandemic digital economy expansion period. The findings offer practical insights for investors, portfolio managers, and market analysts in understanding heterogeneous performance patterns within the Indonesian technology sector before conducting causal or predictive analyses.*
Keywords: *Descriptive Quantitative, IDX Technology, Indonesia Stock Exchange, Stock Return, Technology Stocks.*

INTRODUCTION

The development of digital technology has become one of the major forces transforming the global economic structure. Digital transformation does not only influence how people communicate, transact, and access services, but also changes corporate business models. This transformation is reflected in the rapid development of e-commerce, financial technology, cloud computing, artificial intelligence, data centers, digital payment systems, and connectivity infrastructure. In the capital market context, digital technology also affects how investors evaluate corporate prospects. Technology-related stocks are often perceived as investment instruments with high growth potential because they are linked to future-oriented economic activities. However, technology stocks may also have relatively high price fluctuation risks because they are strongly influenced by growth expectations, investor sentiment, liquidity, valuation, and digital industry dynamics.

Recent literature shows that stock returns can be influenced by various factors, including pandemics, investor attention, market sentiment, and economic uncertainty. Baker et al. (2020) show that the stock market reaction to COVID-19 was unprecedented compared with previous infectious disease outbreaks. Zhang et al. (2020) find that the pandemic increased global financial market risk and uncertainty. Al-Awadhi et al. (2020) show that the increase in confirmed cases and deaths due to COVID-19 affected stock returns. Ashraf (2020) also finds that stock markets responded negatively to the growth of COVID-19 cases. These studies indicate that capital markets are highly responsive to information and uncertainty.

In the context of technology stocks, investor attention and market sentiment become particularly important. Chen et al. (2022) show that investor attention can help predict stock market risk premiums. Ballinari et al. (2022) find that retail investor attention around news releases can increase stock return volatility. Chen & Craig (2023) show that active retail investor attention can influence investor base, stock demand, and stock returns. Fang et al. (2021) also explain that optimistic investor sentiment is associated with higher stock returns in the current period, while pessimistic sentiment has the opposite effect. Fu et al. (2021) find that firm-specific investor sentiment is related to stock price crash risk. (Hu & Sun, 2025) further confirm that retail investor attention is associated with stock return volatility. These findings are relevant to technology stocks because such stocks often become the object of retail investor attention, especially when firms are associated with growth narratives, digital innovation, and future economic prospects.

In Indonesia, the development of the digital economy provides an important foundation for understanding the relevance of technology stocks (Ben-Ahmed et al., 2022). The e-Conomy SEA report prepared by Google, Temasek, and Bain & Company indicates that Indonesia's digital economy is projected to approach a gross merchandise value of around US$100 billion in 2025. This growth is supported by e-commerce, digital financial services, video commerce, digital media, and artificial intelligence adoption (Google, Temasek, & Bain & Company, 2025). Bank Indonesia has also reported rapid growth in national digital transactions, reaching IDR 59.4 thousand trillion in 2025. These developments show that digitalization has become an important part of national economic activity (Bank Indonesia, 2025).

The development of Indonesia's digital economy has also taken place alongside increasing public participation in the capital market. The Financial Services Authority of Indonesia reported that the number of single investor identification accounts in the Indonesian capital market reached 20.2 million by the end of 2025, with 5.34 million new investors added during the year (Otoritas Jasa Keuangan, 2025). The increasing number of investors indicates that the Indonesian capital market is becoming more accessible to the public, including retail investors (Chen & Craig, 2023). In the context of technology stocks, retail investors play an important role because digital and startup-related stocks often attract strong public attention (Ballinari et al., 2022). However, the increasing interest in technology stocks must be accompanied by an understanding of risk and return, as technology stocks may experience both sharp price increases and sharp price declines.

The Indonesia Stock Exchange has accommodated the development of the technology sector through the IDX Technology Index or IDXTECHNO. IDXTECHNO measures the performance of all technology sector stocks based on the IDX Industrial Classification. This index was launched on January 25, 2021 (Bursa Efek Indonesia, 2022). The existence of IDXTECHNO indicates that technology stocks have become a sectoral group with distinct characteristics in the Indonesian capital market. However, sectoral index performance cannot fully describe the return characteristics of each individual stock. Each company has a different business model, size, revenue structure, growth prospect, strategy, and risk exposure. Therefore, company-level analysis remains necessary to understand variations in the return performance of technology stocks (Chen et al., 2022).

The phenomenon of Indonesian technology stocks became increasingly prominent after major digital companies entered the Indonesia Stock Exchange. Bukalapak.com Tbk. became one of the major digital companies that conducted an initial public offering in 2021, while GoTo Gojek Tokopedia Tbk. was listed on the Indonesia Stock Exchange in 2022. These two companies marked an important phase in the entry of platform-based digital companies and startup

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ecosystems into the Indonesian capital market. In addition, DCI Indonesia Tbk. reflects the growing importance of digital infrastructure, particularly data centers, in supporting cloud computing, artificial intelligence, data storage, and digital transformation needs. Other companies such as M Cash Integrasi Tbk., Distribusi Voucher Nusantara Tbk., Kioson Komersial Indonesia Tbk., and Solusi Sinergi Digital Tbk. also represent various technology-related business models, including digital product distribution, digital services, and connectivity infrastructure.

Previous studies on stock returns have mostly used causal approaches, such as regression, event study, panel data models, and volatility models. In the pandemic context, Al-Awadhi et al. (2020), Ashraf (2020), Baker et al. (2020), Zhang et al. (2020), Zaremba et al. (2022), Heyden & Heyden (2021), Mazur et al. (2021), and Scherf et al. (2022) analyzed stock return and volatility responses to COVID-19. In Indonesia, Lina et al. (2022), Abiprayu et al. (2023), and Fianto et al. (2024) also examined the impact of COVID-19 on stock returns, abnormal returns, trading volume, or market efficiency. These studies are important because they provide evidence of market reactions to crisis events. However, most of these studies have not specifically compared the descriptive return characteristics of Indonesian technology stocks in the period after the pandemic and after major digital company IPOs.

Based on this research gap, this study is important because it provides an empirical mapping of the return characteristics of technology stocks in Indonesia. This study does not aim to examine the causal effects among variables. Instead, it aims to describe and compare stock return performance using descriptive statistics. The focus of this study is on eight Indonesian technology-related stocks, namely GOTO, BUKA, DCII, EMTK, MCAS, DIVA, KIOS, and WIFI. The period January 2023–December 2025 was selected because all sample companies had been listed before January 2023, and this period reflects the market adjustment phase after the pandemic, after major digital company IPOs, and after the early euphoria of the digital economy and startup economy.

The novelty of this study lies in the use of a descriptive quantitative approach to compare the returns of Indonesian technology stocks. This study includes companies with diverse business characteristics, ranging from digital platforms, e-commerce, data centers, digital product distribution, media technology, to connectivity infrastructure. Therefore, this study is expected to provide an initial overview of differences in the return and risk profiles of Indonesian technology stocks, while also serving as a foundation for future research using causal methods such as regression, event study, or volatility models.

METHOD

This study uses a descriptive quantitative approach. The quantitative approach is used because the research data are numerical, namely monthly stock returns. The descriptive approach is used because this study aims to describe and compare the return characteristics of Indonesian technology stocks without testing causal relationships among variables. Therefore, this study does not use regression, event study, ARCH/GARCH, or other causal models.

The population of this study consists of companies listed on the Indonesia Stock Exchange that are included in the technology sector or have technology-based digital business characteristics. The sample was selected using purposive sampling, which is a sampling technique based on specific criteria relevant to the research objectives. The sample selection criteria are as follows: (1) the company is listed on the Indonesia Stock Exchange; (2) the company belongs to the technology sector or has technology-based digital business characteristics; (3) the company was listed before January 2023; (4) the company has monthly closing stock price data during January 2023–December 2025; (5) the company was not delisted during the research period; (6) the company did not experience prolonged trading suspension that caused incomplete stock price data; and (7) the company has sufficient data to calculate monthly stock returns.

Based on these criteria, the research sample consists of eight companies, as shown in Table 1.

Table 1. *Research Sample*

No.	Stock Code	Company Name	Business Characteristics
1	GOTO	GoTo Gojek Tokopedia Tbk.	Digital platform, on-demand services, e-commerce, and financial technology
2	BUKA	Bukalapak.com Tbk.	E-commerce and digital platform
3	DCII	DCI Indonesia Tbk.	Data center and digital infrastructure
4	EMTK	Elang Mahkota Teknologi Tbk.	Media, digital business, technology, and digital investment
5	MCAS	M Cash Integrasi Tbk.	Digital product distribution and technology services
6	DIVA	Distribusi Voucher Nusantara Tbk.	Digital voucher distribution and digital ecosystem
7	KIOS	Kioson Komersial Indonesia Tbk.	Technology-based trading platform

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No.	Stock Code	Company Name	Business Characteristics
8	WIFI	Solusi Sinergi Digital Tbk.	Connectivity infrastructure and digital services

The type of data used in this study is secondary data. The data consist of monthly stock returns calculated from the monthly closing stock prices of each company during January 2023–December 2025. Stock price data can be obtained from traceable capital market data sources, such as the Indonesia Stock Exchange and Investing.com. In this study, the stock return dataset contains 36 monthly observations for each company. If the January 2023 return is calculated using the December 2022 closing price as the previous period price, then the 36 observations are appropriate for the January 2023–December 2025 period.

The main variable in this study is stock return. Stock return is calculated using the capital gain/loss formula as follows:

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}$$

Where:

R_{it} = stock return of company (i) in month (t)

P_{it} = closing stock price of company (i) in month (t)

P_{it-1} = closing stock price of company (i) in the previous month

A positive return indicates that the stock price increased compared with the previous month, while a negative return indicates that the stock price decreased compared with the previous month.

The data collection technique used in this study is documentation. The researcher collected monthly closing stock price data from capital market data sources and then calculated monthly stock returns using the capital gain/loss formula. The monthly return data were then arranged by stock code and month for descriptive analysis.

The data analysis technique used is descriptive statistics. The statistical indicators used include mean return, minimum return, maximum return, and standard deviation. Mean return is used to identify the average monthly return of each stock. Minimum return is used to identify the deepest monthly decline. Maximum return is used to identify the highest monthly increase. Standard deviation is used to measure the volatility of stock returns. The higher the standard deviation, the greater the fluctuation of stock returns around their mean.

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RESULT AND DISCUSSION

Descriptive Statistics of Stock Returns

The descriptive statistics of monthly stock returns for the eight Indonesian technology-related companies during January 2023–December 2025 are presented in Table 2. These descriptive statistics provide an overview of the average return, lowest return, highest return, and volatility level of each stock.

Table 2. *Descriptive Statistics of Monthly Stock Returns, January 2023–December 2025*

Stock Code	Observations	Mean Return	Minimum Return	Maximum Return	Standard Deviation	Interpretation
GOTO	36	0.49%	-29.41%	61.67%	18.15%	Low positive average return with moderate volatility
BUKA	36	-1.04%	-18.23%	20.80%	8.53%	Negative average return with the lowest volatility
DCII	36	8.22%	-19.63%	149.73%	34.44%	High average return with high volatility
EMTK	36	1.66%	-21.36%	94.40%	20.21%	Positive average return with relatively high fluctuation
MCAS	36	-5.57%	-42.44%	37.11%	16.99%	Lowest average return and deepest monthly decline
DIVA	36	-2.84%	-39.20%	56.92%	19.72%	Negative average return with relatively high downside risk
KIOS	36	5.63%	-38.86%	245.45%	43.72%	Highest volatility and highest maximum return
WIFI	36	13.22%	-24.37%	198.78%	37.97%	Highest average return with very high volatility

Source: Processed monthly stock return data, January 2023–December 2025.

The results in Table 2 show that Indonesian technology stocks have different return characteristics across companies. These differences can be seen from the values of mean return, minimum return, maximum return, and standard deviation. This condition indicates that although all sample companies operate within the technology or digital business ecosystem, the return performance of each stock is not homogeneous.

Based on mean return, WIFI recorded the highest average monthly return at 13.22%. The next highest stocks were DCII with a mean return of 8.22% and KIOS with a mean return of 5.63%.

A positive mean return indicates that, on average, these three stocks recorded monthly price increases during the observation period. This finding suggests that several technology stocks were still able to generate relatively high return performance in the period after the pandemic and after the initial euphoria of digital companies in the Indonesian capital market.

WIFI, which recorded the highest mean return, shows the strongest average monthly performance compared with other stocks in the sample. Meanwhile, DCII also showed a high average return. Conceptually, DCII's position as a data center company can be associated with increasing market attention toward digital infrastructure, cloud computing, artificial intelligence, and data storage needs. However, because this study is descriptive, this finding cannot be interpreted as a causal relationship between the development of the data center industry and DCII's stock return. This study only shows that during the observation period, DCII had a higher average return characteristic than most other sample stocks.

On the other hand, BUKA, MCAS, and DIVA recorded negative mean returns. BUKA had a mean return of -1.04%, DIVA recorded -2.84%, and MCAS recorded -5.57%. MCAS was the stock with the lowest average monthly return in the research sample. This finding indicates that not all technology-related stocks generated positive average returns, even though Indonesia's digital economy has shown a growth trend. Therefore, digital economy growth is not automatically reflected in positive performance across all technology stocks.

Based on minimum return, MCAS recorded the deepest monthly decline at -42.44%, followed by DIVA at -39.20% and KIOS at -38.86%. A large negative minimum return indicates that several technology stocks faced substantial monthly downside risk. In the investment context, this information is important because investors should not only focus on average return potential but also consider the possibility of extreme losses during the observation period.

The deep monthly declines experienced by MCAS, DIVA, and KIOS indicate that technology stocks may have significant downside risk. This is relevant to Fu et al. (2021), who find that firm-specific investor sentiment is associated with stock price crash risk. Although this study does not directly examine investor sentiment, the minimum return findings show that certain technology stocks have substantial downside movements that should be considered by investors.

Based on maximum return, KIOS recorded the highest monthly return at 245.45%, followed by WIFI at 198.78% and DCII at 149.73%. A high maximum return indicates that several technology stocks experienced very large monthly price increases. However, a high maximum return does not necessarily indicate stable stock performance. Maximum return should be interpreted together with standard deviation because stocks with extreme increases often also have large fluctuations.

KIOS is an example of a stock with the highest monthly upside potential as well as the highest volatility. This shows that high return opportunities in technology stocks may be accompanied by substantial price fluctuation risk. This finding is consistent with Ballinari et al. (2022), who explain that retail investor attention around market information can increase stock return volatility. Chen & Craig (2023) also show that active retail investor attention can affect stock demand and return. In the context of Indonesian technology stocks, large price increases may occur when market attention toward certain stocks increases, although this study does not test such a mechanism causally.

Based on standard deviation, KIOS recorded the highest volatility at 43.72%, followed by WIFI at 37.97% and DCII at 34.44%. A high standard deviation indicates that stock returns fluctuate substantially around their average values. Therefore, KIOS, WIFI, and DCII can be categorized as stocks with relatively high return volatility within the research sample. These stocks have high return potential but also face substantial price fluctuation risk.

In contrast, BUKA recorded the lowest standard deviation at 8.53%. This indicates that BUKA’s returns were relatively more stable compared with other stocks in the sample. However, this stability does not necessarily indicate better performance because BUKA’s mean return was negative. Thus, a more stable stock does not always generate a positive average return. Conversely, stocks with high average returns may have higher volatility. This finding highlights the importance of interpreting return and risk indicators simultaneously.

The differences in return characteristics across companies indicate that Indonesian technology stocks cannot be treated as a uniform group. Although all sample companies are related to technology or digital business, each stock has a different risk-return profile. These differences may arise from differences in business models, company size, investor expectations, liquidity, revenue structure, and market sentiment toward corporate prospects. However, because this study

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does not use a causal model, these factors can only be explained as interpretive context, not as direct causes of stock return changes.

The findings of this study are also relevant to recent literature on stock returns and investor attention. Chen et al. (2022) show that investor attention can help explain variations in stock returns. Fang et al. (2021) show that optimistic and pessimistic investor sentiment have different effects on stock returns. Hu & Sun (2025) emphasize that retail investor attention is related to stock return volatility. In the Indonesian context, the increasing number of retail investors and the development of digital investment communities may strengthen the relevance of investor attention to technology stocks. Stocks associated with digitalization, startup economy, artificial intelligence, data centers, e-commerce, and fintech may attract high market attention.

The results also show that digital economy growth does not always produce uniform stock returns. Indonesia has experienced strong digital economy development, as reflected in the projected digital economy value approaching US$100 billion in 2025 and the increase in national digital transactions. However, the findings of this study show that the return performance of technology stocks remains different across companies. In other words, digital economy growth provides a supportive macro context, but investors still need to evaluate each stock based on its own return and risk characteristics.

Practically, the findings provide an initial overview for investors regarding Indonesian technology stocks. Investors seeking high returns should recognize that stocks with high mean returns, such as WIFI, DCII, and KIOS, also have high volatility. Conversely, stocks with low volatility, such as BUKA, do not necessarily generate positive average returns. Therefore, investment decisions in technology stocks should consider the balance between return potential and price fluctuation risk.

Academically, this study contributes by presenting an updated empirical mapping of Indonesian technology stock returns during January 2023–December 2025. This period is important because it reflects the phase after the pandemic, after major digital company IPOs, and after the adjustment of technology stock valuations. This study can serve as a foundation for future research that examines the determinants of technology stock returns using regression, event study, volatility models, or portfolio analysis.

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CONCLUSION

This study aims to describe and compare the return performance of Indonesian technology stocks during the period January 2023–December 2025. Based on the descriptive statistical analysis, the findings show that Indonesian technology stocks have different return characteristics across companies. WIFI recorded the highest mean return at 13.22%, followed by DCII at 8.22% and KIOS at 5.63%. Meanwhile, MCAS recorded the lowest mean return at -5.57%.

In terms of downside risk, MCAS had the deepest minimum return at -42.44%, followed by DIVA at -39.20% and KIOS at -38.86%. In terms of upside potential, KIOS recorded the highest maximum return at 245.45%, followed by WIFI at 198.78% and DCII at 149.73%. Meanwhile, based on standard deviation, KIOS had the highest volatility at 43.72%, while BUKA had the lowest volatility at 8.53%.

These findings indicate that Indonesian technology stocks have diverse risk-return profiles. Stocks with high average returns tend to have higher volatility, while stocks with lower volatility do not necessarily generate positive average returns. Therefore, investors need to consider return and risk simultaneously when making investment decisions in technology stocks.

This study does not conclude causal relationships because it uses a descriptive quantitative approach. Therefore, the results cannot be interpreted as evidence that digital economy growth, artificial intelligence, e-commerce, fintech, data centers, or investor behavior directly caused increases or decreases in stock returns. This study provides an initial overview of the historical return characteristics of Indonesian technology stocks. Future research can extend this study by using regression, event study, volatility models, or portfolio analysis to examine the factors that influence technology stock returns in Indonesia.

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