Atma Jaya Accounting Research (AJAR)
Volume 6 Issue 2, August 2023
P-ISSN: 2654-590X, E-ISSN: 2656-0410

Weak Market Efficiency for Technology Stocks During The COVID-19 Pandemic

Ullanchiang Meillenia Tumbal[1], Robiyanto[2], Harijono[3]
Faculty Business and Economics, Universitas Kristen Satya Wacana

Abstract: Many studies related to capital market efficiency have been carried out, but currently there is a lack of research on weak forms of market efficiency in other financial markets such as the technology market. The purpose of this study is to analyze the efficiency of the weak form of the market for technology stocks during the Covid-19 Pandemic. The data used in this study is data on daily closing prices for technology stocks from 2020-2022 from the Indonesia Stock Exchange. This data is obtained from Yahoo Finance Technology. The analytical tool used is the Runs Test followed by the Augmented Dickey-Fuller and Correlogram for Robustness Checking. The results of this study state that there are several technology stocks that are included in the efficient form in a weak form, which means that the prices of these stocks during the Covid-19 Pandemic are random walk, so that technical analysis cannot be applied in analyzing several technology stocks, namely EMTK, MTDL and LUCK. The results of this study suggest that investors in trading EMTK, MTDL and LUCK shares do not use technical analysis.
Keywords: Indonesia Stock Exchange, Technology Stocks, Market Efficiency, Runs Test, Weak Form

Article Info:
Received: April 15th, 2023 | Revised: June 22th, 2023 | Accepted: August 25th, 2023
DOI: https://doi.org/10.35129/ajar.v6i02.428

[1] Email: ulan.tumbal@gmail.com (Correspondence Author)
[2] Email: robiyanto.robiyanto@uksw.edu
[3] Email: harijono.harijono@uksw.edu

1. INTRODUCTION

The capital market has a major impact on the development process of a country. The capital market provides investment facilities for investors as well as a source of long-term funding for companies. Capital market activity is influenced by macro-environmental conditions and situations. Where in 2020 Indonesia was faced with the Covid-19 Pandemic which also influenced market behavior resulting in a significant decline in the JCI. Based on the IDX (2022) it shows a significant decrease in the JCI in 2020 reaching -5%. However, it will increase again in 2021 by 10% and in 2022 by 4%. The increase in the JCI that occurred in 2021 was also driven by the volatility of technology stocks in the technology industry.

When the Covid-19 Pandemic occurred, information technology was used more rapidly, especially when the system was implemented work from home so that the company's operations can continue to move Gusma (2020). The technology industry is a company that trades technology products and services IDX (2022). Where, in 2021 the shares of technology sector issuers created a very impressive performance, namely during 2021 the technology sector stock index increased to 183.70% Investor. id (2021). So that investors are interested in the performance and prospects of the technology industry in the future.

Investors are one the important role takers in the capital market. The conventional financial theory explains that in the decision-making process, investors should behave rationally. Rational investors in determining decision-making will review and analyze in advance all the information obtained so that they can minimize uncertainty and can obtain rational explanations in making decisions to obtain significant profits Ackert & Deaves. (2010). Therefore, market efficiency has a big influence on obtaining profits as expected.

Fama (1970) explains that a market is defined as efficient when all market information is visible through stock prices at all times and price adjustments quickly to all new information. So since then, capital market efficiency has become the basis for efficiency tests. Not only on the capital market but on foreign exchange, commodity, and technology markets. Fama (1970) also classifies market efficiency into three parts. Namely market efficiency in the weak form, semi-strong, and market efficiency in the strong form.

Market efficiency in the weak form is related to random walk theory which states that historical values are not related to present values. Where the market is in a weak form whose purpose is to determine the shape of the price of a stock that should already be seen at the current stock price and unpredictable future stock prices. The market is said to be efficient if the current price reflects all past information. Supramono et al. (2017). Then, the market can be said to be efficient in the semi-strong form when prices describe all publicly available information, while the market is efficient in the strong form when asset prices describe all public and private information.

Various studies have been conducted to examine the efficiency of the capital market and other financial markets. Dickinson & Peterson (1995) conducted research other than the stock market and options market. Meanwhile, Jain et al. (2013) conducted a study on the stock market in India, Robiyanto (2015) conducted a study on the stock market in ASEAN and the precious metals market. Other studies were also conducted on the bond market, namely Robiyanto (2017) and Onwukwe et al. (2018) who reviewed the efficiency of the insurance market in Nigeria.

It can be seen from previous research that most of the research on market efficiency has been carried out on the stock market and in several other financial markets, namely Rakesh & Parikshit (2007) examining the efficiency of the weak form in the Indian stock market. On the other hand, Giovanni et al. (2022) examined the efficiency of the strong form capital market during the Covid-19 Pandemic in Indonesia. Meanwhile, for the efficiency of the weak form of the capital market towards technology stocks in Indonesia, literacy is still lacking.

Based on this explanation, it is necessary to conduct a study that focuses on the efficiency of the weak form of the capital market, especially for the technology industry. Where, the technology industry played a significant role during the Covid-19 Pandemic. Therefore, this study specifically examines market efficiency in the weak form of technology stocks. Various tests have been done in several countries, one of them is Collins et al. (2011) found that the stock market in Africa runs randomly or is a weak form of market efficiency. Likewise, a study that examined weak market efficiency in Bahrain conducted by Asiri (2008) stated the same thing. In addition, Neifar & Gharbi. (2023) in his research related to weak market efficiency in the Canadian stock market shows that the Canadian Islamic Price Index (DJICPI) experiences random or efficient movements in a weak form. Not only that, in several phenomena of the world economic crisis which also had an impact on the Indian capital market, the capital market in India experienced random movements Jain et al. (2013). Therefore, based on this explanation, the hypothesis is formulated as follows:

H1: There is a weak form of market efficiency for technology stocks

This research uses the method Run test, Correlogram and Augmented Dickey-Fuller test. The results of this study are expected to provide theoretical benefits to investors and academics in increasing knowledge and literature on related topics.

2. LITERATURE REVIEW

Capital Market

A capital market is a meeting place for sellers and buyers who have an important role in a country's economy so that it becomes a benchmark for the level of economic progress of a country. Murdiyanto & Akbar (2021). Apart from playing a role in improving the economy of a country, the capital market also has several other functions in carrying out its activities, including when the capital market acts as an intermediary between borrowers and lenders by providing funds (Rahmawati & Pandasari, 2016). The Covid-19 pandemic has had a significant impact on the capital market, where investors in conducting investment activities must consider various things first. This is because when the Covid-19 Pandemic hit, it caused economic growth to experience a sharp decline significant Saraswati, (2020). Issuers listed on the Indonesia Stock Exchange were also affected by the Covid-19 Pandemic which certainly affected the movement of the issuer's share price so issuers had to reconstruct a new strategy to maintain their business. Various methods continue to be carried out, starting from continuing to innovate, digitizing, and listing the company on the stock exchange. Reporting from the IDX (2022) throughout 2022 there will be 59company who have made a public offering of shares.

Shares

Stocks are part of the most popular financial market instruments in various circles because they can provide attractive benefits for investors IDX (2022). Based on Law No. 8 of 1995 explains that shares are a certificate of ownership of a listed company. Where stocks are one of the company's alternatives for corporate funding. In investing in stocks, investors can benefit through dividends and capital *gain*. In the stock market, indicators index stocks are used to find out and measure the level of change in stock prices and one of them is the Indonesia Stock Exchange Robiyanto (2018). With the hope, investors can get a normal return or even an abnormal return. The expected profit is also supported by market behavior both internally and externally to form an efficient market. During 2022, there will be 42 stock price indexes, one of which is the Jakarta Composite Index (IHSG).

Random Walk Theory

The random walk theory was first put forward by Bachlier (1900) which stated that new information will be the basis for investors and analysts to predict intrinsic value that will occur independently, which will be followed by new information that will also be independent. Random step theory views that changes in a price in the future are unpredictable, where changes in price increases on a particular day cannot imply further increases or prices on the following day, resulting in prices not forming a memory Titan & Gabriela (2015). If the movement of a price has a random pattern, then various changes in a price from time to time are random or independent of one another. This indicates that there is a relationship between changes in current price changes and price changes in the past Yulianti & Jayanti (2019).

Market efficiency

Stock market efficiency has become a major part of research in financial economics. This is due to the interest among investors towards the rate of return (Return) with market efficiency theories. Market efficiency was first conveyed by Fama (1970) where security is said to be efficient when each security price formed gives a full picture of the available information or there is no previous information that can be used to estimate future prices. come. According to Beaver (2002), market efficiency is an attachment between information and stock prices. A market is said to be efficient when no one will get abnormal returns (Abnormal Returns) based on risk, having implemented existing trading strategies. Thus, based on these definitions it can be said that there is a relationship between market efficiency and the response of each security price to relevant information available in the capital market. Fama (1970) divides market efficiency into three categories, namely market efficiency in the strong form, and market efficiency in the semi-strong form, market efficiency in the weak form.

Strong form market efficiency (Strong form)

Strong form market efficiency explains that the price that occurs describes all available information, both general and personal information Gumanti & Utami (2002). This means that the strong form market summarizes all past information that has a relationship between information in general and personal information or information that may not be known to the public. In the investment world, especially in some securities, some groups can obtain information that the general public does not get. Khajar (2008). However, some parties believe that by doing fundamental analysis they can get more detailed information than what is published. Therefore, the strong market efficiency form is the most stringent. This relates to the definition of market efficiency in the strong form itself, that is, market prices describe all information, both public and private. So the market efficiency of the strong form makes no one either individual or institution gain a return that is not normal (Abnormal return) in a certain period.

Market efficiency semi-strong form

The semi-strong form of market efficiency is when all security prices fully reflect published information. This published information is the company's financial reports that can affect the price of securities, starting from companies that publish this information to all companies listed on the capital market Tjandra (2006). Yulianti & Jayanti (2019) explained that the market is said to be efficient in a semi-strong form when the movement of security prices quickly describes all of the new information that is available and relevant. Where all information shared with the public is divided into three, namely new information related to only one company, several companies, and all companies. Thus, when an efficient market is in a semi-strong form, investors can take advantage of the information shared to obtain abnormal profits (Abnormal returns) in the long term.

Weak form market efficiency (Weak form)

This hypothesis assumes that stock prices describe all past information on the price of a security. Supramono et al. (2017) Past information can be interpreted as the information that has occurred. The hypothesis has a relationship with the theory of random walk, where historical data has nothing to do with current values. This means to find out the price of a security in a weak form market, past information should have been seen on the current security price and future security prices cannot be determined by Khajar (2008). When the market hypothesis is satisfied, the price effect is independent of the previous security price pattern. Then any price changes will follow the rules of random walk. In the weak form of efficiency, investors are very interested when random information occurs, because they believe that when the price of a stock starts to move up, the price of the stock will continue to move up for a certain period. Thus, it can be said that market efficiency is in weak form when the current price has shown all past data.

3. RESEARCH METHODS

Data and Data Sources

The data used in this research is secondary data which is analyzed using quantitative techniques. The secondary data taken is historical data on the price index of technology stocks. The data source comes from a long time ago www.investment.com, www.finance.yahoo.com, and www.idx.co.id. The data used is data from the 2020-2022 period, which was during the Covid-19 Pandemic and after the Covid-19 Pandemic. Purposive sampling this research is on technology stock index technology that has never been suspended or suspended by the Indonesian Stock Exchange, namely GLVA shares**,** ENVY**,** DIVA**,** MCAS**,** SKYB**,** EMTK**,** PTSD**,** MTDL, and LUCK. The data that is processed is daily data backward before the research is conducted on March 18, 2023.

The rate of return from the stock index variable can be calculated by the formula:

$$Return\ Stock\ Indeks\ X = \frac{(Indeks\ X_t - Indeks\ X_{t-1})}{Indeks\ X_{t-1}} \quad \text{.....(1)}$$

Where:
t = The closing price of the stock index on the Indonesia Stock Exchange on day t
t-1 = The closing price of the stock index on the Indonesia Stock Exchange on day t-1
X = The index studied in this case is the technology index3.3 Teknik Analisis

Analysis Techniques

To determine market efficiency, correlation trials will be measured based on the method of Run test where run test is used to see whether stock prices occur randomly or systematically. Testing is done using cut point mean and median. The hypothesis that has been formulated in this study will be accepted if it obtains a statistically significant Z value at a significance level of 1%, 5%, and 10% Pulungan et al. (2018). Then to review the robustness, a unit root test will be carried out using *Correlogram* Jain et al. (2013) Dima et al. (2009).

4. RESULTS AND DISCUSSION

Descriptive Analysis

Descriptive statistics on technology stock prices in this study can be observed in Table 1. All stock prices studied involved 725 days of observation. Based on these results, MCAS shares recorded the highest price of all the shares in this study, with a value of 14500. Meanwhile, ENVY and SKYB were stocked with the lowest value during the observation period, namely 50.00.

Table 1. Descriptive Statistics Result

	N	Mean	Std. Deviation	Minimum	Maximum
MTDL	725	475.0552	175.19355	183.00	805.00
ENVY	725	86.9614	110.13897	50.00	895.00
SKYB	725	51.3559	1.95466	50.00	81.00
DIVA	725	1259.7621	494.67173	300.00	2512.50
EMTK	725	1555.4745	732.93643	407.00	3000.00
LUCK	725	259.1559	119.28171	119.00	880.00
PTSN	725	218.3145	32.44763	133.00	330.00
MCAS	725	7132.5586	4471.03498	645.00	14500.00
GLVA	725	304.2193	62.38399	170.00	650.00

Source: Yahoo Finance (2020-2022), data has been processed

Analysis Runs Test

Based on test results Runs Test in Table 2 provides an overview of the data and results obtained, using the mean and median with standard errors (Alpha) of 1%, 5%, and 10%. The test results show that of the 9 Technology Stocks, 6 Technology Stocks are significant, at a significance level of 1% and 10%. Some of the significant technology stocks namely; GLVA shares with a mean value of 0.072 and a median of 0.007, ENVY with a mean and median value of 0.000, DIVA with a mean and median value of 0.077, MCAS and SKYB with a mean and median value of 0.000, and PTSN with a mean value of 0.024 and 0.002 for the median. Based on the Random Walk Theory put forward by Yulianti & Jayanti (2019) states that when a price has a random pattern, the change in price from time to time is random. This indicates that there is no weak market efficiency for the 6 Technology Stocks above or it is not following Random Walk Theory. Meanwhile, there are Technology Stocks that are not significant, namely; EMTK shares which have mean and median values of 0.076 and 0.598, MTDL have mean and median values of 0.244 and 0.063 and LUCK which have values of 0.448 and 0.555 for the mean and median. These results indicate that there is weak market efficiency for the 3 Technology Stocks above because the significance level obtained is greater than 1%, 5%, and 10% according to Random Walk Theory. This is in line with previous research by Rakesh & Parikshit (2007).

Table 2. *Runs* Test Results

Name	Runs Test	
	Mean	Median
GLVA	0,072*	0,007***
ENVY	0,000***	0,000***
DIVA	0,077*	0,077*
MCAS	0,000***	0,000***
SKYB	0,000***	0,000***
EMTK	0,076*	0,598
PTSN	0,024***	0,002***
MTDL	0,244	0,063*
LUCK	0,448	0,555

Source: Yahoo Finance (2020-2022), data has been processed

Analysis Correlogram and Augmented Dickey-Fuller

Subsequent testing using test equipment Augmented Dickey-Fuller and Correlogram of the 36 lags shown in Table 3. Test results using Augmented Dickey-Fuller found the results of 9 Technology Stocks that had been tested at a significance level of 1%, 5%, and 10%, and found no unit root. for a test, Correlogram shows that of 9 Technology Stocks with a significance level of 1%, 5%, and 10%, the result is that there are Technology Stocks whose market is efficient, namely EMTK because the probability obtained is not significant or greater than the significance level of 1%, 5%, and 10%. Meanwhile, there are Technology Stocks whose markets are not efficient, namely GLVA, ENVY, DIVA, MCAS, SKYB, PTSN, and LUCK because the resulting probabilities are significant at a significance level of 1%, 5%, and 10%. However, from the 8 Technology Stocks above, there were 2 Technology Stocks that passed the test Runs Test MTDL and LUCK. So it remains to be said that MTDL and LUCK are stocking with an inefficient market. This is in line with previous research by Jain et al. (2013).

Table 3. *Correlogram* Results

Name	Correlogram
GLVA	36
ENVY	36
DIVA	36
MCAS	36
SKYB	36
EMTK	0
PTSN	30
MTDL	34
LUCK	6

Source: Yahoo Finance (2020-2022), data has been processed

5. CONCLUSION

This study concludes that there are technology stocks whose technology sector is included in the weak form of market efficiency during the Covid-19 Pandemic, namely EMTK, MTDL and LUCK. Where in this study obtained the results of trials using Run Test and proceed with the test Augmented Dickey-Fuller and Correlogram. Out of 9 Technology Shares there are 3 Shares that passed the Run Test and of the 3 Technology Stocks there is only 1 Share that fits the weak form of market efficiency criteria. This study also found price movement patterns of 1 Technology Stock which was tested using Augmented Dickey-Fuller and Correlogram. Based on the explanation above, it shows that 1 Technology Stock, namely EMTK, is in accordance with the Random Walk Theory. For MTDL and LUCK stocks, it is assumed to run randomly, but this is not in accordance with the Random Walk Theory.

So that technical analysis can be done on technology stocks, except especially on EMTK, MTDL and LUCK stocks. Technical analysis is not appropriate when used on these stocks because these stocks are stocks that have a very active market. The technology stock market is affected by every change that occurs on a macroeconomic basis. This study shows that the weak form of the market efficiency hypothesis does not apply to technology stocks. Weak market efficiency also applies to the capital market and has been studied a lot. So it can be concluded that the weak form of the market efficiency hypothesis applies in the capital market, especially in technology stocks.

The limitation of this research is that the research only focuses on Technology Stocks. While there are several types of stocks in other sectors that can be tested for market efficiency in the weak form using different methods.

REFERENCES

Journal / Book:
Ackert, & Deaves. (2010). *Behavioral Finance: Psychology, Decision-Making and Markets*. books google. http://bitly.ws/AqDi

Journal Article:
Ackert, & Deaves. (2010). *Behavioral Finance: Psychology, Decision-Making and Markets*. books google. http://bitly.ws/AqDi

Asiri B. (2008). Testing weak form efficiency in the Bahrain stock market. *Journal of Emerging Markets*, *3*(1), 38–53. https://doi.org/10.1108/17468800810849213

Bachlier. (1900). *The Random Character Of Stock Market Prices*.

Beaver. (2002). Perspectives on Recent Capital Market Research. *Journal Storage (JSTOR)*, *77*(2), 453–474. https://doi.org/10.2308/accr.2002.77.2.453

Collins, Kwaku, Danbolt, & Dewotor. (2011). Testing the Weak Form Efficiency in African Stock Markets. *Journal of Managerial Financial*, *37*(3), 195–218. https://doi.org/10.1108/03074351111113289

Dickinson, & Peterson. (1995). Expectations Of Weekend And Turn-Of-The-Month Mean Return Shift Implicit In Index Call Option Prices. *Journal Of Financial And Strategic Decision*, *8*(3), 69–75. http://www.financialdecisionsonline.org/archive/pdffiles/v08n3/dickinson.pdf

Dima, Bogdan, Milo, & Raisa. (2009). Testing The Efficiency Market Hypothesis For The Romania Stock Market. *Journal Annales Universitatis Apulensis Series Oeconomica*, *11*(1), 402–415. https://doi.org/10.29302/oeconomica

Fama. (1970). Efficient Capital Markets: A Review Of Theory And Empirical Work. *Journal of Finance*, *25*(2), 383–461. https://doi.org/10.2307/2325486

Giovanni, Farrel, Robiyanto, & Harijono. (2022). Efisiensi Pasar Modal Bentuk Kuat di Indonesia Selama Pandemi Covid-19. *Journal Management & Accounting Expose* , *5*(2), 1–11. https://doi.org/10.36441/mae.v5i2.790

Gumanti, & Utami. (2002). Bentuk Pasar Efisien Dan Pengujianya. *Jurnal Akuntansi Dan Keuangan*, *4*(1), 54–68. https://doi.org/10.9744/jak.4.1.pp.%2054-68

Gusma, Defriko, & Rita. (2020). Peranan Implementasi Tata Kelola Teknologi Informasi (IT Governance) sebagai Faktor Penting dalam Meningkatkan Kinerja Perusahaan. *Jurnal Inovasi Pendidikan Ekonomi*, *10*(1), 1–07. https://doi.org/10.24036/0110770

IDX. (2022a). *Pengertian Industri Teknologi*. Idx.Co.Id. https://idx.co.id/id/produk/saham/

IDX. (2022). *Ringkasan Indeks*. Idx.Co.Id. https://idx.co.id/id/data-pasar/ringkasan-perdagangan/ringkasan-indeks

IDX. (2022b). *Saham*. Idx.Co.Id. https://idx.co.id/id/produk/saham/

Investor. (2021). *Edun! Saham Sektor Teknologi Melejit 183% saat Sektor Lain Terpuruk*. Investor.Id. https://investor.id/market-and-corporate/244432/edun-saham-sektor-teknologi-melejit-183-saat-sektor-lain-terpuruk

Jain, Vyas, & Roy. (2013). A study on weak form of market efficiency during the period of global financial crisis in the form of random walk on Indian capital market. *Journal of Advances in Management Research*, *10*(1), 122–138. https://doi.org/10.1108/09727981311327802

Khajar. (2008). Pengujian Efisiensi Dan Peningkatan Efisiensi Bentuk Lemah Bursa Efek Indonesia Pada Saat Dan Sesudah Krisis Moneter. *Jurnal Manajemen Teori Dan Terapan*, *1*(3), 144–164. https://doi.org/10.20473/jmtt.v1i3.2369

Murdiyanto, & Akbar. (2021). Perbandingan Kinerja Indeks Dow Jones, DAX, Nikkei 225, Kospi dan IHSG di Masa Pandemi Covid-19. *Jurnal Nusantara Aplikasi Manajemen Bisnis*, *6*(1), 100–108. https://doi.org/10.29407/nusamba.v6i1.15500

Neifar, & Gharbi. (2023). Weak EMH and Canadian Stock Markets: Evidence from Linear and Nonlinear Unit Root Tests. *Journal of Islamic Accounting and Business Research*, *14*(4), 629–651. https://doi.org/10.1108/JIABR-06-2021-0156

Onwukwe, Emenike, & Ali. (2018). Weak Form Efficiency of the Insurance Industry: Empirical Evidence from Nigeria. *Jurnal Keuangan Dan Perbankan*, *22*(1), 14–22. https://doi.org/10.26905/jkdp.v22i1.1800

Pulungan, Parlagutan, Wahyudi, & Suharnomo. (2018). Does The Crude Palm Oil Market Walk Randomly. *Jurnal Keuangan Dan Perbankan*, *22*(2), 211–218. https://doi.org/10.26905/jkdp.v22i2.2023

Rahmawati, & Pandasari. (2016). Reaksi Pasar Modal Dari Dampak Peristiwa Bom Plaza Sarinah Terhadap Abnormal Return Perusahaan LQ 45 Yang Terdaftar di BEI. *Riset Akuntansi Dan Keuangan Indonesia*, *1*(2), 126–133. https://doi.org/10.1093/cid/civ542

Rakesh, & Parikshit. (2007). Weak Form Efficiency In Indian Stock Markets. *International Business & Economics Research Journal*, *6*(3), 57–64. https://doi.org/10.19030/iber.v6i3.3353

Robiyanto. (2015). Month Of The Year Effect Pada Beberapa Pasar Modal Di Asia Tenggara Dan Pasar Komoditas. *Jurnal Ekonomika Dan Bisnis*, *18*(2), 53–64. https://doi.org/10.24914/jeb.v18i2.260

Robiyanto. (2017). Month Of The Year Effect Pada Pasar Obligasi Di Indonesia. *Jurnal Ekonomi Dan Bisnis*, *20*(2), 291–302. https://doi.org/10.24914/jeb.v20i2.1093

Robiyanto. (2018). Performance Evaluation of Stock Price Indexes in the Indonesia Stock Exchange. *International Research Journal of Business Studies*, *10*(3), 173–182. https://doi.org/10.21632/irjbs.10.3.173-182

Saraswati. (2020). Dampak Pandemi Covid-19 Terhadap Pasar Saham Di Indonesia. *Jurnal Riset Akuntansi Dan Keuangan Dewantara*, *3*(2), 153–163. https://doi.org/10.26533/jad.v3i2.696

Supramono, Widhiastuti, & Utami. (2017). International Journal of Economics and Financial Issues Market Reaction to Cabinet Reshuffle: The Indonesian Evidence. *International Journal of Economics and Financial Issues*, *7*(5), 183–188. http:www.econjournals.com

Titan, & Gabriela. (2015). The Efficient Market Hypothesis: Review of Specialized Literature and Empirical Research. *Procedia Economics and Finance*, *32*, 442–449. https://doi.org/10.1016/s2212-5671(15)01416-1

Tjandra. (2006). Pengujian Efisiensi Pasar Setengah Kuat Secara Informasi terhadap Pengumuman Inisiasi Dividen (Studi Empiris pada Perusahaan-Perusahaan yang Terdaftar di Bursa Efek Jakarta Periode Tahun 2000-2003). *Jurnal Akuntansi Dan Investasi*, *7*(2), 175–194. https://journal.umy.ac.id/index.php/ai/article/view/891

Yulianti, & Jayanti. (2019a). PENGUJIAN EFISIENSI PASAR BENTUK LEMAH PADA PASAR MODAL INDONESIA PERIODE 2014-2017. *Jurnal Gentiaras Manajemen Akuntansi*, *11*(2), 178–190. https://doi.org/10.47768/gema.v11i2.169

Yulianti, & Jayanti. (2019b). Pengujian Efisiensi Pasar Bentuk Lemah Pada Pasar Modal Indonesia Periode 2014-2017. *Jurnal Gentiaras Manajemen Dan Akuntansi (GEMA)*, *11*(2), 178–190. https://doi.org/10.47768/gema.v11i2.169

Website:

IDX. (2022a). *Pengertian Industri Teknologi*. Idx.Co.Id. https://idx.co.id/id/produk/saham/

IDX. (2022). *Ringkasan Indeks*. Idx.Co.Id. https://idx.co.id/id/data-pasar/ringkasan-perdagangan/ringkasan-indeks

IDX. (2022b). *Saham*. Idx.Co.Id. https://idx.co.id/id/produk/saham/

Investor. (2021). *Edun! Saham Sektor Teknologi Melejit 183% saat Sektor Lain Terpuruk*. Investor.Id. https://investor.id/market-and-corporate/244432/edun-saham-sektor-teknologi-melejit-183-saat-sektor-lain-terpuruk