The Effect of COVID-19 on the Market Reaction of Abnormal Stock Returns: An Empirical Study in Indonesia

Abstract Indonesia has been struck by the Covid-19 outbreak, which has impacted a variety of industries. This study provides decision-makers with up-to-date findings on the reaction to abnormal stock returns before and during the covid-19 pandemic. This study was carried out using a quantitative-comparative approach. Because it has the most liquid liquidity level on the Indonesia Stock Exchange, the LQ 45 business was chosen. Data observations were conducted from the end of February 2020 (Normal Conditions) on February 26, 27, and 28 to early March 2020 on March 3, 4, and 5 (Pandemic Covid-19). According to the findings of the data test, there are disparities in anomalous returns at LQ 45 enterprises in Indonesia before and after the Covid-19 pandemic. This conclusion offers a different investment strategy, which involves selecting investment items that are often chosen by individual investors. Investment in gold and mutual funds are two of them. This suggestion is based on the fact that the values of these items are consistent over a long period of time. Investments in property is also a fantastic strategy to use during the current global economic recovery.

Keywords Investing Analysis, Stock Market, Event Study, Efficient Market.

JEL Clasification Code: G1, G11, M41, O16

1. Introduction

If a stock exchange market that trades securities is able to reflect all conceivable information promptly and accurately, the market is deemed efficient. The idea behind an efficient market is that investors will always consider all available information while making decisions. As a result, the same price they trade reflects it. As a result, the information factor is already factored into market prices. The efficient market theory is still a topic of discussion among financial practitioners and academics. (Ricciardi et al., 2008).

The efficient market hypothesis was first proposed by Fama in 1970, and it divides market efficiency into three types: weak form, strong form, and strong form. In 1991, however, he developed the efficiency notion into a more broad classification to evaluate return predictability, semi-strong form efficiency or event studies, and market efficiency testing in the strong form, known as private information testing. According to this concept, a market is efficient if no one (individual or institutional investors) can get abnormal profits using existing trading tactics after risk has been taken into account. No one can get abnormal returns with the use of private information if the market is efficient and robust (Kwon & Yin, 2015).

The increasing number of potential investors in the stock market makes research or observations on stock returns attractive to investors or academics in Indonesia (Deswanto & Siregar, 2018; Ryandono et al., 2021; Widyarti et al., 2021). On the other hand, various events such as political conditions, natural disasters, wars, legal issues also often affect the activity on the stock market in Indonesia. One of the events that are allegedly able to cause changes in prices and trading volume in 2020 is the condition of the Covid-19 pandemic in Indonesia.

The Covid-19 pandemic in Indonesia has resulted in a shift in trading hours on the Indonesia Stock Exchange, which is a negative signal (bad news) that encourages investors to sell their stock. The Covid-19 outbreak has wreaked havoc on Indonesia's economy, affecting a variety of industries. Recessions and economic crises as a result of an economic downturn are the hazards that investors and stock market analysts are concerned about (Baker et al., 2020). Various

enterprises in the real sector were affected by the Covid-19 pandemic, causing significant disruptions in business and production activities, with some even deciding to close or go out of business. Of course, this has the effect of forcing many employees to resign, so lowering the community's purchasing power. Because it has an impact on the management of public finances, the economic instability caused by Covid-19 is one of the historic occasions. This event must be experimentally demonstrated to have a greater impact on the state of the Indonesian stock market; consequently, an event study must be used to test the information content of the event.

Anomalies in occurrences that these investors did not expect can result in abnormal returns (Serrano-Cinca et al., 2019). Several models, including the market model/single index model and the capital asset pricing model, can determine abnormal returns. Several people Research on the pattern of changes in stock returns in the stock market has concluded that some deviations can affect stock prices (Khanthavit, 2020; Phuong, 2021; Shen & Zhang, 2021; Widyarti et al., 2021; Xiong et al., 2021), but little research has been done on the impact of Covid-19 on stock prices with the highest level of liquidity. There are a lot of stocks in Indonesia that are classified as LQ45 and have a lot of liquidity. This stock is unique because it is the most sought after by both domestic and international investors. The anomalous return was employed as a standard in this investigation.

This study, based on this description, gives up-to-date COVID-19 data that are valuable to decision makers. Of course, in terms of science, this conclusion is also more fair and accountable. In the following session, we'll go over the big theory that was applied in this study. The study methodologies employed, as well as the test findings and discussion, are also explained. The conclusion, innovation, and limits of this study's execution are described in the final section of this article, so that future researchers might find ways to overcome them.

2. Literature Review and Hypothesis Development

2.1. Psychological Rational Theory

Investors will think rationally to maximize their wealth from the investments they have made. So, investors will look for as much information as possible about the company's financial statements (performance) company), risk, macroeconomic conditions, inflation, interest rates, and others. However, As theory develops investing in the stock market, there has been a shift in investor tendencies in making investment decisions. Psychological factors are often used in an attempt to explain the reasons behind event study. This explanation is unrelated to market fundamentals, but human behavior does provide some quantitative data.

Securities market theory *underreactions* and overreactions are based on two (2) psychological biases, namely: *overconfidence* investor (precision of personal information) and biased self-attribution (asymmetric shift in an investor's confidence. Thus, this theory indicates that investors overreact to private information signals and underreact to public information signals.

2.2. Signaling Theory

Signaling theory discusses how to eliminate information asymmetry to outside parties. Before making an investment decision, an investor needs to have access to information. Investors in the stock market require a lot of complete, relevant, accurate, and timely information as a decision-making tool. According to signaling theory, good quality organizations will purposefully send signals to the market, allowing the market to discern between them. Investors will be able to make investment decisions based on information presented as an announcement. If the announcement has a positive value, the market is likely to respond when it receives it.

Signals from circulating information can influence the actions taken by investors. Investor reactions are reflected in the share price and trading volume surrounding the release of the information (Widyarti et al., 2021). To find out whether there is an investor reaction related to information signals from the company, an event study can be used.

2.3. Random Walk Theory

The term "random walk" refers to price changes that do not follow any sort of pattern. There is no correlation between all types of change and earlier changes. Price swings in the stock market are usually independent and random. The random component arises as a result of fresh knowledge about the price of specific shares. The expected value of the random magnitude can be zero and can be positive or negative. Market efficiency theories are only tangentially related to the random walk theory, which asserts that past data is unrelated to present value. If the market is inefficient, historical prices cannot be used to forecast present prices. This suggests that in a weakly efficient market, investors are unable to profit from previous information, which is unusual (abnormal returns).

2.4. Abnormal Return

Abnormal returns occur when the return obtained by investors is different from the results of the analysis. Abnormal return is also obtained from the difference between the expected return and the return obtained. The difference in return will be positive if the return obtained is greater than the expected return or calculated return. While the return will be negative, if the return obtained is smaller than the expected return or the calculated return. There are three (3) models used to estimate abnormal returns that are:

1) *Mean Adjusted Model*

The mean adjusted model assumes the expected return is the constant equal to the average of the previously realized returns during the estimation period.

$$E(Rit) = \frac{\Sigma Rit}{t}$$

Information :

- E(Rit) = expected return of the i-th security at time t
- Rit = actual return of the i-th security at time t
- t = estimation period

actual return (Rit) used to analyze the data obtained from the investment. This value is obtained by calculating the difference in individual share prices during the current period with the previous period by ignoring dividends, which is formulated as follows:

$$Ri,t = \frac{Pi,t - Pi,t-1}{Pi,t-1}$$

Information:

- Ri,t = Stock Return i at time t
- Pi,t = Share Price i in period t
- Pit-1 = Share Price in i period t-1

2) *Market Model*

Market models are used to calculate the expected return in two stages, namely forming an expectation model using realization data during the estimation period and using an expectation model to estimate the expected return in the window period. The expectation model can be formed using the OLS (Ordinary Least Square) regression technique with the equation:

$$E(Rit) = \alpha i + \beta i\ Rmt + \varepsilon it$$

Information :

- E(Rit) = expected return of the i-th security in the estimation period t
- αi = intercept, independent of Rmt
- βi = slope, systematic risk, dependent on Rmt

Meanwhile, Rmt = market return, calculated by the formula:

$$Rmt = \frac{(IHSGt - IHSGt\text{-}1)}{IHSGt\text{-}1}$$

εit = residual error of security i in the estimation period t

3) Market Adjusted Model

Market Adjusted Model The current market index return is the correct estimator for estimating a security's return, according to the principle. Because the predicted security return is the same as the market index return, it is not essential to utilize the estimation period to build the estimation model when employing this model. The formula for calculating the Market Adjusted Model:

$$ARit = Rit - Rmt$$

Information :

- ARit = abnormal return of stock i on day t
- Rit = actual return of stock i on day t

Meanwhile, Rmt = Market return, which is calculated by the formula:

$$Rmt = \frac{(IHSGt - IHSGt\text{-}1)}{IHSGt\text{-}1}$$

2.5. Market Anomaly

A stock market anomaly is a type of phenomenon that occurs. In contrast to the concept of an efficient stock market, market oddity can also be thought of as a technique or strategy. This occurrence occurs and can be leveraged to generate abnormal returns in the form of gains or losses. The purpose of market anomalies is to provide investors with an overview as well as instructions and suggestions to help make decisions. Investors should be cautious about using this market anomaly occurrence as a tool to make investing decisions (Serrano-Cinca et al., 2019). This is because there is no guarantee that market anomalies would aid investors in making better investment decisions.

2.6. Impact Covid Effect Against Abnormal Company Stock Returns in Indonesia

The Covid 19 epidemic has had an impact on public health as well as the economy in Indonesia, since many businesses had to halt operations to prevent the virus from spreading further (Phuong, 2021). The price of corporate shares on the Indonesia Stock Exchange is one of those affected by the pandemic. On March 13, 2020, the World Health Organization (WHO) proclaimed Covid-19 a pandemic. An incidence of pneumonia in Wuhan, China, prompted the creation of Covid-19. Pneumonia is a wet lung illness in which the air sacs in one or both lungs become inflamed

(Ryandono et al., 2021).

The Covid-19 epidemic is currently affecting people all over the world. The stock market was initially unaffected, but as more victims were confirmed, the stock market began to respond badly (MN) (Phuong, 2021). This has led stock market prices to fall, especially when the WHO declared Covid-19 a pandemic, and has resulted in negative abnormal returns, The Covid-19 epidemic also has an impact on stock market dynamics, causing stock exchanges all over the world to decrease. and increase inefficiencies in the stock market (Shen & Zhang, 2021; Wu et al., 2021). In Indonesia, this also has a negative impact on the stock market and affects investors in making investment decisions (Ryandono et al., 2021). Based on several descriptions of the findings of previous researchers conducted in Asia, Europe, and America, the hypothesis proposed in this study is as follows.

Ho: *there is no difference between abnormal returns Stocks before and after the Covid Effect hit Indonesia*

Ha: *there is a difference between abnormal returns Stocks before and after the Covid Effect hit Indonesia*

3. Research Method

This research was conducted by a quantitative-comparative method by comparing one or more variables in one or more different samples, at different times (Jaya, 2020). The event that was tested in this study was to see whether there was an abnormal return obtained by the shareholders of the LQ 45 company due to the Covid effect in Indonesia. This covid-19 pandemic occurred in March 2020, so the test uses a comparison between February 2020 (Normal Conditions) and March 2020 (Covid-19 Pandemic). The LQ 45 company was chosen because this stock is known for the most liquid liquidity level and is well rated on the Indonesia Stock Exchange. The company sectors used as samples are all industrial companies listed in LQ 45 in February 2020 (Normal Conditions) and March 2020 (Covid-19 Pandemic). The use of the entire industry on LQ 45 stocks, gives more optimism to the assumption that the occurrence of abnormal returns will be greater on the stock market in Indonesia.

The variable in this research is the abnormal return. Abnormal *return* is the difference between the actual return and the expected return that occurs during the end of February 2020 (Normal Conditions) on 26,27, and 28 February 2020 until the beginning of March 2020 on 3,4, and 5 March 2020 (Pandemic covid-19). We apply this daily stock data observation referring to the literature (Brown & Warner, 1985). This calculation and test are carried out with the following data analysis procedure sequence: (Hartono, 2016).

$$ARit = Rit - (E)Rit$$

Information:

- ARit = Abnormal return of company LQ 45
- Rit = Return of shares of each company LQ 45
- (E)Rit = Expected Return of company LQ 45

$$E(Rit) = \frac{\Sigma Rit}{t}$$

ARit is the abnormal return of stock i in the event period t, Rit is the realized return of stock i in the event period t, and E[Rit] is the expected return of stock i in the event period t.

Information :

- E(Rit) = expected return of the i-th security at time t

- Rit = actual return of the i-th security at time t
- t = estimation period

Furthermore, the Actual return (Rit) is calculated using the following formula.

$$Rit = Pit – Pit\text{-}1$$

Information:

- Rit = Stock Return i at time t
- Pit = Share Price I in period t
- Pit-1 = Share Price in i period t-1

Several stages were carried out in the analytical test of this study, namely, descriptive statistical tests, normality tests, paired sample t-tests, and ***Wilcoxon signed-rank test.*** The basis for the decision to accept or reject the hypothesis in the Wilcoxon sign rank test is as follows:

a) If the probability (Asymp. Sig) < 0.05 means that Ho is rejected, it means that there is a difference.
b) If the probability (Asymp.Sig) > 0.05 means that Ho is accepted, it means that there is no difference.

4. Results and Discussions

The first test is a descriptive statistical test of the abnormal return value of the company's LQ 45 stock. The description is as follows (Table 1).

Table 1. 2020 Abnormal Return Value

No.	LQ Stock Code 45	26 February 2020	27 February 2020	February 28, 2020	Covid-19 pandemic	03 March 2020	04 March 2020	05 March 2020
		-3	-2	-1	0	+1	+2	+3
1.	ACES	-12.5	-12.5	7.5	0	10	46.7	-33.3
2.	ADRO	-17.5	-42.5	-5	0	16.7	43.3	-20
3.	AKRA	-40	-70	-50	0	0	-6.7	0
4.	ANTM	-15	-15	-12.5	0	20	10	0
5.	ASII	-87.5	-50	-212.5	0	133.3	50	50
6.	BBCA	-275	-325	0	0	800	400	-16.7
7.	BBNI	-100	-112.5	-25	0	33.3	100	-83.3
8.	BBRI	-10	-175	30	0	80	80	-46.7
9.	BBTN	-12.5	-22.5	-25	0	26.7	40	-20
10.	BMRI	-75	-150	-37.5	0	166.7	183.3	83.3
11.	BRPT	-30	-27.5	2.5	0	13.3	36.7	-3.3
12.	BSDE	-12.5	-15	-15	0	56.7	43.3	-10
13.	BTPS	25	-80	-140	0	140	86.7	66.7
14.	CPIN	-212.5	-25	-100	0	283.3	266.7	50
15.	CTRA	-12.5	-10	10	0	6.7	20	-16.7
16.	ERAA	-27.5	-32.5	-10	0	100	30	3.3
17.	EXCL	-20	-40	65	0	-13.3	26.7	-40
18.	GGRM	-100	-912.5	-1087.50	0	850	666.7	-550
19.	HMSP	-37.5	-27.5	-15	0	50	23.3	0
20.	ICBP	-75	-137.5	-137.5	0	533.3	0	0
21.	INCO	-65	-125	-85	0	146.7	-6.7	-26.7
22.	INDF	-100	-62.5	-200	0	300	33.3	16.7
23.	INKP	-100	-62.5	-175	0	383.3	183.3	-66.7

24.	INTP	-187.5	-37.5	-162.5	0	-366.7	983.3	-350
25.	ITMG	75	-62.5	137.5	0	116.7	-66.7	-33.3
26.	JPFA	-20	-15	-12.5	0	23.3	16.7	0
27.	JSMR	-115	15	-60	0	93.3	40	46.7
28.	KLBF	-5	-17.5	-15	0	10	43.3	36.7
29.	LPPF	-30	-35	30	0	66.7	13.3	-153.3
30.	MNCN	-40	10	-2.5	0	6.7	60	-36.7
31.	PGAS	-2.5	-55	-52.5	0	36.7	53.3	0
32.	PTBA	-25	-35	-25	0	113.3	66.7	-6.7
33.	PTPP	-40	-27.5	5	0	3.3	30	-6.7
34.	PWON	-2.5	-5	-5	0	13.3	10	-10
35.	SCMA	-30	-7.5	-15	0	13.3	26.7	-16.7
36.	SMGR	-100	-62.5	-200	0	350	183.3	-66.7
37.	SRIL	-4	-5	4	0	-1.3	1.3	1.3
38.	TBIG	0	-17.5	-27.5	0	16.7	16.7	0
39.	TKIM	-325	-187.5	-200	0	583.3	483.3	100
40.	TLKM	-40	-20	10	0	120	140	0
41.	TOWR	7.5	-25	-15	0	20	13.3	3.3
42.	UNTR	-137.5	-212.5	-487.5	0	650	566.7	-316.7
43.	UNVR	0	-75	-162.5	0	150	200	-16.7
44.	WIKA	-27.5	0	-15	0	6.7	43.3	-30
45.	WSKT	-22.5	-17.5	-12.5	0	10	33.3	-16.7

Source: IDX, 2021.

According to the findings of descriptive statistical analyses, abnormal returns before and after the Covid-19 pandemic are extremely volatile, with an average abnormal return of -55.2, -76.2, and -77.8 on February 26-28, 2020. The abnormal return value decreases because the return received by investors is less than the expected return. Many investors believe that the Covid-19 virus will not spread to Indonesia, but once it did and became a pandemic, it has returned abnormally high values of 137.2, 118.1, and -34.1 since March 03-06 2020. On March 3, 2020, the anomalous return value is still positive, indicating that investors received a higher return than expected. This is likely due to investors' continued confidence in the Indonesian government's ability to contain the COVID-19 pandemic. However, until March 6, 2020, abnormal returns are getting lower or declining, indicating that market optimism is beginning to wane as a result of the COVID-19 pandemic. and further suppressing stock market activity because company productivity has also begun to be restricted. This situation resulted in losses for many investors in several industrial sector stocks that were affected by the first effects of the COVID-19 pandemic. As a result of the COVID-19 pandemic, market optimism became unstable, and stock market activity was further repressed since firm productivity was beginning to be curtailed. Many investors in various industrial sector stocks that were affected by the first symptoms of the COVID-19 epidemic suffered losses as a result of this situation. As a result of the covid-19 epidemic, market optimism began to wane, significantly suppressing stock market activity because firm productivity had also begun to be limited. Many investors in various industrial sector stocks that were affected by the first symptoms of the COVID-19 epidemic suffered losses as a result of this situation.

Table 2. Normality test results

		Unstandardized Residual
N		45
Normal Parameters, b	mean	0E-7
	Std. Deviation	,55844846
Most Extreme Differences	Absolute	,116
	Positive	,116
	negative	-,072

Kolmogorov-Smirnov Z	,775
asymp. Sig. (2-tailed)	.585
a. Test distribution is Normal.	
b. Calculated from data.	

Based on Table 2, it can be stated that the data used has a normally distributed distribution because the Kolmogorov Smirnoff test yielded a significant value (p) for all observation variables > 0.05. As a result, the paired sample t-test is the next test.

Table 3. Paired sample t-test results

		Paired Differences					t	Sig. (2-tailed)
		mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	26 Feb 2020 - 03 March 2020	-192,333	279,771	41,706	-276,386	-108,281	-4,612	,000
Pair 2	27 Feb 2020 - 04 March 2020	-194,200	305,679	45.568	-286,036	-102,364	-4,262	,000
Pair 3	28 Feb2020 - 05 March 2020	-43.578	129,365	19,285	-82.443	-4.712	-2,260	0.029

The abnormal return test is between February 26, 2020, and March 3, 2020; 27 February 2020 to 04 March 2020; and 28 February 2020 to 05 March 2020, as shown in Table 3, with significant values of 0.000, 0.000, and 0.029 or 0.05, respectively. This indicates that abnormal returns in LQ 45 enterprises in Indonesia differed before and after the covid-19 epidemic. The t table values were -4.612; -4.262; and -2.260, respectively, which means that the direction of the relationship for each test is negative, so it can be concluded that if there is no Covid-19 pandemic event, then the abnormal return condition of LQ 45 shares in Indonesia tends to be more stable, given that there were no political or legal events that interfered with the economic condition of the stock market in February and March.

Table 4. Wilcoxon singned rank test results

	26 Feb 2020-03 March 2020	27 Feb 2020-04 March 2020	28 Feb 2020-05 March 2020
Z	-5.481b	-5,830b	-1.981b
asymp. Sig. (2-tailed)	,000	,000	0.048
a. Wilcoxon Signed Ranks Test			
b. Based on negative ranks.			

Table 4 shows that the Wilcoxon singned rank test confirms the prior findings from the paired sample t-test that there is a difference in anomalous returns at LQ 45 enterprises in Indonesia before and after the covid-19 epidemic. This finding supports the hypothesis that Ho is rejected and Ha is accepted. LQ 45 businesses are well-known equities with high liquidity levels and a high share price ranking on the Indonesia Stock Exchange. Of course, this stock has a larger national economic impact than the 638 other Indonesian company shares.

5. Conclusions

The LQ 45 stock was chosen based on the value of the stock market index listed on the Indonesia Stock Exchange, as well as other factors, including the firm with the biggest market capitalization in the previous 12 months. Stock investment trading on LQ45 has numerous benefits for investors, as investors can hedge their actual shares as well as speculators by

transacting on LQ45 Futures. The difference between a stock index and a futures contract is in the contract that uses the underlying. For futures, the underlying sale and purchase reference will take the value of the indexed stock price with a contract agreement with a certain contract value agreed upon by the company and the customer.

The LQ45 stock index is also one of the most prominent and well-known indices on the Indonesia Stock Exchange (IDX), as the 45 stocks that make up the index have the most liquid liquidity in the stock market, as well as strong and positive fundamental performance. It is referred to as superior and prestigious since the standard provisions and standards for issuers wishing to participate are limited to only 45 shares, and it already has the best track record in terms of oversight over the previous year. LQ45 and its index have become a standard for market participants (retail and institutional investors) in the management of crowdfunding, including mutual funds, pension funds, and insurance. Stocks that will become members of LQ45 will be subject to a rigorous selection procedure by the selection team, which will include proof of consistent performance (rather than being chosen at random or arbitrarily).

However, the Covid-19 pandemic has affected all Indonesian stocks, no matter how good or better they are. The stock price index fell in March 2020, according to the Indonesia Stock Exchange (IDX). This is because many companies and investors are selling their stock. The occurrence of an unexpected pandemic or crisis, such as this one, also encourages investors to maintain focus on their assets, regardless of their size. However, certain investors begin to consider solutions that will allow them to invest even if their income is decreased due to the pandemic. This is accomplished by selecting investment products that are usually chosen by individual investors. Gold investing and mutual funds are two of them. During this pandemic, this investment product has become a new passion in the financial world. Gold is also preferred as an investment since it is more consistent throughout time. Furthermore, the property is one of the current investing trends, as sales are currently declining and prices are beginning to reflect a fair market value.

According to the results of the data analysis, there are disparities in abnormal returns in LQ 45 companies in Indonesia before and after the COVID-19 pandemic. The assessment of investment returns for the current year should be the first step towards stabilizing post-pandemic economic conditions. It is recommended that investors who fall into the moderate risk category and have an adequate emergency fund invest in hazardous stocks with a company that has a superior fundamental value or an investment value with a higher rate of return. As a result, investors' current analytical point of view must be capable of changing their risk profile from risk-averse to risk seeker while being cautious.

Given the present state of things, Indonesia is well on its way to recovery. The best course of action for investors in this New Normal period is to be cautious with their money because future economic prospects are still unclear. However, at this time, it doesn't hurt for moderate-risk investors to invest more in mixed mutual fund products. The major goal is to keep the value of return on investment constant so that the risk of a pandemic is kept to a minimum. This can be accomplished by investing in products such as Corporate Bonds, which can yield profits although not as big as stocks. This step is one of the efforts to avoid abnormal stock returns that are too high and can reduce the portion of investment in medium-risk instruments. This advice is given because the essence of investing is to get a high rate of return and that investment is idle money outside of an emergency fund, so you should still be smart in choosing the appropriate risk at this time.

However, to maximize financial gains from shares sold or purchased, investors should stay objective and utilize the correct analysis, both technical and fundamental, as the basis for making investment decisions. This statement is a research limitation. Future researchers should continue researching phenomena that occur over the course of a year in various stock markets to strengthen the trend of finding monthly abnormal returns for decision making, and these findings will be useful for the development of efficiency theory, and the present state of the stock market

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The results of this study we contribute to the development of knowledge of capital market efficiency theory.

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