Analysis of Fixed Mobile Convergence (FMC) Product Launch on Telecommunication Stock Returns in Indonesia

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Abstract

This research evaluates the possibility of a Fixed-Mobile Convergence (FMC) strategy in the telecommunications sector, particularly in light of the significant increase in data consumption globally. Based on a report from Ericsson Mobility and market analysis, FMC services are expected to contribute around 10-20% to the total revenue of telecommunications companies. The success of this strategy in Western Europe and the vast potential in the Asia Pacific region, including Indonesia, confirm this. This study is conducted using a comparative descriptive method on the stock returns of FMC players in Indonesia, thus aiming to prove whether FMC events can affect the dynamics of the telecommunications market in Indonesia and enrich investors' understanding of the potential of FMC on the financial performance of telecommunications companies, this can subsequently be manifested in the market's stock performance of telecoms business. The importance of analyzing changes in stock returns for investors of FMC operators in Indonesia, such as XL, SmartFren, and Telkomsel, both before and after the launch of FMC products, is a particular focus. In this case, the paired t-test and Wilcoxon Signed Rank Test methods assess significant differences between the means of two paired samples. The findings of this study offer practical guidance for investors looking at FMC strategies as information for making more informed investment decisions and improving their portfolio performance.

Keywords: *Event Study, Fixed-Mobile Convergence (FMC), Return, Shares, Telecommunications Sector.*

Introduction

Fixed Mobile Convergence (FMC) is a concept based on the use of technology in the same service for mobile broadband and fixed broadband networks that connect to the internet as the basis of modern society communication services (Sunarno, 2010); it refers to the integration between mobile broadband and fixed broadband networks so that consumers can easily switch in the network between the two without restrictions. (Curwen, 2006) states that this additional functional coverage provides the ability to automatically forward calls from the mobile network to the fixed network or vice versa and provides additional service convenience for customers. Fixed Mobile Convergence (FMC) is in its early stages in Indonesia and has great growth potential as it becomes available, driven by rapidly evolving and expanding market dynamics (Pachnicke et al., 2016). Surging data demand, cross-industry digitalization, and the ramifications of the COVID-19 epidemic are driving factors. (Lavender et al., 2020: 13) State that the demand for fiber optic services (FTTx), which is the fiber-based transmission, is a strategic imperative for all major telecommunications network operators (Mpapalika et al., 2006) and is in line with the growth of the FMC category.

Based on data, the global growth of data per customer has increased significantly in the last ten years (Awwad, 2021). The market opportunity in the telecommunications and connectivity sector is still growing (Хорин & Krikunov, 2021). Predictions of the contribution of this FMC business strategy in the telecommunications sector are between 10-20% of the company's revenue, so fixed broadband connections are expected to be part of the Fixed-Mobile Convergence (FMC) category (Martínez et al., 2018), which

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indicates integration between fixed broadband and mobile broadband services. Almost all Mobile Network Operators (MNOs) in Western Europe are implementing FMC, except for Hutchison 3G UK (Three).

Telecommunication companies can retain customers and increase revenue by offering FMC services as part of their corporate strategy (Albon, 2006). FMC has proven to be an effective strategy in retaining customers, but it also comes with risks as it relies on heavy price discounts (Pachnicke et al., 2016) to encourage FMC plans. Therefore, telecommunication companies are exploring new strategies in addition to the traditional discount approach (Laitsou et al., 2017). Examples of new strategies include offering FMC packages with additional features such as higher internet speeds or access to premium content and exploring other options such as partnerships with financial or energy service providers.

FMC is currently at an early stage in Indonesia. However, the potential for FMC in Indonesia is vast and can provide many benefits to telecom users, companies, and drivers of Indonesia's digital environment. The survey conducted by the Indonesian Internet Service Provider Association (APJII) revealed a significant increase in the number of Internet users in Indonesia, reaching 196.7 million individuals by the second quarter of 2020, marking an 8.9% growth compared to the previous year (Arjadi et al., 2018), while Anlysys Manson's data in 2023 showing mobile and fixed data penetration during 2022 states that Fixed-line Internet Penetration is lower than Unique Subscriber Penetration in Southeast Asia.

In Indonesia, XL is the pioneer Mobile Network Operator (MNO) for FMC services, launching XL SATU on May 31, 2021. Since its launch, XL SATU has become a popular converged communications solution. XL's FMC service was made possible through a merger and acquisition strategy with fixed broadband provider Linknet. With XL SATU, XL offers affordable data bundle packages and stable internet speeds, making it the right choice for daily communication. With this latest innovation, XL strives to provide the best service to its customers throughout Indonesia.

On the other hand, Smartfren partnered with Oxygen.id (Moratelindo) on October 25, 2021, to introduce a mobile broadband and fixed broadband connectivity solution - True Quadplay - which integrates four services in one unified billing platform. This True Quadplay solution allows customers to access broadband internet, cable TV, landline, and cellular services with one integrated account. The synergy strategy, a concept deeply rooted in the integration of various organizational practices and business units, plays a crucial role in enhancing operational efficiency, market performance, and overall competitiveness (Swink et al., 2005) of Sinarmas Group subsidiaries is used to create FMC products so that customers can enjoy faster and more stable internet speeds with a reliable Smartfren network and Moratelindo's strong fiber network. This solution is expected to provide convenience and comfort for customers in accessing various communication and entertainment services without the hassle of buying multiple cards or paying bills separately.

Meanwhile, state-owned company Telkom through Telkomsel launched an integrated FMC proposition, Telkomsel One, following the transfer of IndiHome services to the Telkomsel portfolio on July 21, 2023. Telkomsel One is the latest innovation from Telkomsel that provides integrated FMC services (Riawan, 2024). Customers can enjoy more complete and integrated services easily. Telkomsel One combines mobile broadband, home internet, cable TV, and other digital services in one easy and managed package. With the presence of Telkomsel One, customers will be increasingly facilitated in meeting their daily communication and entertainment needs.

Based on (Aziz, 2023) the FMC strategy description in Indonesia, the market share of residential subscribers (fixed broadband) is still significant. Namely, 60 million households (www.katadata.com) can be combined with mobile broadband subscribers of more than 200 million people, making business in the FMC field very potential to grow the growth of the Telecommunications industry. The movement of stock prices reflects the actions investors take when they invest in a firm to generate profit, also known as a return. The investment management framework will examine the degree of profit on all FMC driving elements in the five stocks to be researched.

Literature Review

Efficient Market Theory

The Efficient Theory created by (Fama, 1970), which states that stock prices in the market reflect all available information. There are three types of efficient markets, Weak efficient markets only consider past information, Semi-strong efficient markets consider all publicly available information, Strong and efficient markets incorporate numerous types of information, including both private and business-related information.

Efficient market theory explains how stock prices are affected by new information (Phuong, 2021). According (Dedunu, 2017) when new information becomes available, the market quickly incorporates it, and it is reflected in stock prices. This aligns with the concept of a robust and effective market (Shaik & Maheswaran, 2017) . However, there is a discussion about the speed and accuracy with which the market absorbs information. In reality, markets may not be fully efficient due to the costs associated with acquiring information and the inherent uncertainty (Grossman & Stiglitz, 1980).

Event Study

Event study, which means event study, is how the market responds to an announced event. Event studies are a valuable tool in assessing market efficiency and information content (Wang & Wang, 2021). The accumulative abnormal return observed in the event study approach (Kritzman, 1994) describes that the process carried out is: **i.** Determine the event (event) that will be the object of research; **ii.** Determine the research period into an event window; **iii.** Determine the criteria required in the event study; **iv.** Designing the testing framework; **v.** Conduct the necessary measurements to assess the effect of the event; **vi**. Analyze the influence of the event under study

The Indonesia Stock Exchange (IDX) is Indonesia's primary marketplace for trading stocks and many other financial products. The IDX, first known as Vereniging voor de Effectenhandel, was founded in 1912 and has since expanded to become one of the largest stock exchanges in Southeast Asia. The IDX functions as a regulatory body and marketplace for trading shares, playing a crucial role in the Indonesian economy by enabling companies to raise funds and attract investments. The IDX is an investment platform providing a diverse range of stocks from listed firms, bonds, and several other financial instruments. The IDX utilizes an advanced electronic trading system to facilitate convenient and expeditious investor participation in the Indonesian capital market.

The telecommunications sector equities listed on the Indonesia Stock Exchange are highly sought after by investors, primarily due to the significant expansion of the telecommunications business in Indonesia. This industry comprises enterprises providing mobile telephony services, internet services, and other data services. Due to the rising internet penetration and widespread smartphone usage in Indonesia, telecommunication firms are experiencing substantial opportunities for growth. PT Telekomunikasi Indonesia (Telkom), PT Indosat Ooredoo, and PT XL Axiata Tbk are telecommunications firms whose shares are actively traded on the IDX. The performance of stocks in this sector typically indicates technology developments and the level of digital adoption in Indonesia. As a result, it is a crucial sector for investors interested in the technology and communications industry to monitor closely.

Fixed Mobile Convergence (FMC)

(Laitsou et al., 2017) The convergence between fixed and mobile broadband in the telecommunications sector is accelerating worldwide, including in Europe. Industry mergers between fixed broadband and mobile broadband operators have led to fewer telecommunications companies operating (Martínez et al., 2018), resulting in large companies having a more dominant position.

Many trends and drivers supporting the convergence process are taking place, according to (Caviggioli, 2016), leading to a decline in the revenues of telecommunications companies in developed countries. The

saturation of the telecommunications market is increasing, while competition is intensifying due to regulations, new entrants, and the challenge of Over The Top (OTT) players (Awwad, 2021). Average Revenue Per User (ARPU) has decreased. The explosion of IP traffic requires significant investments in operator networks. These investments are difficult to finance due to increasing risks and the ongoing revenue crisis of telecom companies. Integrated operators with abundant assets are in the most competitive position.

According to Deloitte US's "2016 Telecommunications Industry Outlook" report, the telecommunications industry faces various challenges and growth opportunities. This is influenced by innovations in non-traditional business sectors such as Internet of Things applications, mobile payments (mPayments), and evolving communication technologies (Caviggioli, 2016). The telecommunications sector plays a crucial role in driving growth, fostering innovation, and navigating disruptive forces across industries. This pivotal role is underscored by the convergence of technologies such as mobile substitution for fixed networks, triple-play services, and the emergence of transformative technologies like the Internet of Things (IoT) and cloud computing (Li, 2022). Mobile devices and related fixed broadband connectivity are increasingly integrated into society, and they are vital in driving digital growth trends.

Returns

According to (Balqis, 2021), stock returns refer to the measurement of stock performance or the profit obtained from investing in stocks. In finance and investment, this return is considered an important aspect that needs careful attention (Gniadkowska-Szymańska, 2017). Stock returns can provide an overview of the performance of a company and the stock market as a whole. Therefore, investors often consider stock returns when conducting financial and investment analysis. This helps them to make more innovative and more effective decisions in managing their investment portfolio. (Acheampong et al., 2014) stated that a good understanding of stock returns will help investors manage risk and optimize their potential investment returns effectively. The formula for looking at stock returns is as follows:

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

(Kurniawan et al., 2021) identified various elements that can influence the valuation or pricing of shares. 1. Expected income from each share when profits are earned; 2.   The level of risk of the estimated profit; 3. The proportion of the company's debt to equity; and 4. Dividend policy.

General economic activity, taxes, and stock exchange conditions also contribute to stock price changes from outside the company. Some other activities of the company, such as the condition of the company, external restrictions, the strength of supply and demand for shares in the market, and the ability of investors to analyze stock investment, also affect stock prices. In research (Mudjiyono, 2012), the main factor that causes changes in stock prices is the different perceptions of information held by each investor.

Abnormal Return

As stated by (Mulyati and Murni, 2018), investment refers to the act of allocating resources into one or more assets for an extended duration with the aim of generating future profits. In this context, the legal principle emphasizes that investors must be willing to take more significant risks to achieve higher returns. Although there are various types of investments, the author of this study only discusses stocks as a popular investment instrument for investors. According to (Hartono, 2013), The discrepancy between the actual and expected returns is known as the abnormal return.

$$AR_{i,t} = R_{i,t} - E(R_{i,t})$$

The return utilised to make investment decisions is known as the expected return. Furthermore, according to Hartono (2013). Mathematically, the expected return with the market-adjusted model method can be formulated as follows:

$$E(R_{i,t}) = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$$

Research Gaps

Data growth and operational burden reduction are challenges in FMC strategy (Li et al., 2015). While many operators worldwide have implemented FMC and sold their products in telecommunications, Indonesia has only started in the past three years. The Telecommunication Index with EXCL, LINK, FREN, DSSA and TLKM stocks traded in the stock market was examined for favourable and unfavourable returns when each company issued FMC products. A comparison of abnormal returns before and after the launch of FMC products from ECXL, LINK, FREN, DSSA, and TLKM in Indonesia produces new information on optimizing portfolio return and risk. However, few studies specifically record the performance of FMC companies in Indonesia.

Research Hypothesis

Based on this framework, the hypotheses in this study are:

There is a difference in abnormal return of PT Telkom Indonesia Tbk before and after the launch of FMC products.

There is a difference in abnormal return of PT XL Axiata Tbk before and after the launch of FMC products.

There is a difference in abnormal return of PT Link Net Tbk before and after the launch of FMC products.

There is a difference in abnormal return of PT Smartfren Telecom Tbk before and after the launch of FMC products.

There is a difference in abnormal return of PT Dian Swastatika Sentosa Tbk before and after the launch of FMC products.

Methodology

This research is a comparative descriptive research study that, according to (Febrianti, 2018), will describe the comparison between two observations, namely the stock returns of FMC companies before and after FMC products are launched.

The purpose of descriptive research is to provide a history or to describe aspects relevant to the events under study from the perspective of a person, industrial organization, or other entity to provide an overview of the management field to be studied (Keegan et al., 2018). Furthermore, descriptive research in the management field can involve reviewing the literature to provide insights into specific topics like human resource management, risk communication, and decision support systems (Boholm, 2008; Tuček et al., 2015).

Variable Operationalization According to a research variable is an observable character of an observed unit that is an identifier or attribute of a group of objects. The purpose of the variable is to determine the variation between one object and another object in a particular group.

This study compared the results of calculating research variables before and after FMC. Does FMC affect the variables of this study? The variable used is a stock return. This variable is calculated based on the event, namely the launch of FMC products.

Table 1. Variable Operationalization

Variable	Concept	Indicator	Scale
Return	The difference between the closing price of the current day and the previous day compared to the closing price of the previous day.	$R_i = \dfrac{P_t - P_{t-1}}{P_{t-1}}$	Ratio
Return Abnormal	Difference between actual return and expected return	$RTN_{i,t} = R_{i,t} - E(R_{i,t})$	Ratio

The population is all groups, events, or exciting things researchers want to investigate. This is a group of people, events, or exciting things used as objects/subjects with specific qualities and characteristics set by researchers, who then conclude. In this study, the population is telecommunications sector stocks; namely, 19 lists of telecommunications stocks are listed on the IDX (source: https://snips.stockbit.com/investasi/saham-telekomunikasi).

The sample is part of the population. The sample consists of several members selected from the population. The sampling technique used is purposive sampling, a sample chosen based on predetermined criteria (Guest et al., 2006). In this research, the focus of the research object is five companies that are FMC actors until October 2023 by the criteria: Companies whose shares are included in the telecommunications sector in Indonesia; Companies whose shares are included in the telecommunications sector in Indonesia and whose business is not as a telecommunications service operator; Companies that have not announced the launch of FMC products in Indonesia; and Companies that IPO after FMC products are launched in Indonesia so that stocks that meet the research criteria are TLKM, EXCL, LINK, FREN, and DSSA by looking at the closing stock price per day of each of these stocks are within three months (60 working days) before the launch of FMC products and three months (60 working days) after the launch of FMC products. Research (Borges & Gairifo, 2013) shows that abnormal returns occur before certain events; abnormal returns are identified as early as 60 days before the announcement date.

In this study, secondary data is used. Secondary data comes from other parties and has been processed so that it can be directly used. Secondary data includes government publications, information from companies, previous research, literature documents, online data, websites, and the Internet. Researchers use secondary data from Yahoo Finance and IDX.

Using the following steps, descriptive statistics offer a summary or descriptive analysis of the data based on the mean, standard deviation, and variance:

1. Determine the average level (mean), standard deviation and variance of stock returns from TLKM, EXCL, LINK, FREN and DSSA.

2. Determine the abnormal stock returns of TLKM, EXCL, LINK, FREN and DSSA before and after FMC products are launched.

3. Whether the data distribution is a normal distribution is determined by the data normality test. The normality test in this study was conducted utilizing the Kolmogorov-Smirnov test. The purpose of this test is to ascertain the normal distribution of the samples included in this investigation. For the analysis to utilize parametric approaches, it is necessary to satisfy the normalcy condition. Specifically, the data is

derived from a Gaussian distribution. Non-parametric statistics are employed when the data does not follow a normal distribution. The criterion for determining data normality in decision-making is based on the significance value (Sig.). If the Sig. is greater than 0.05, the data is considered normally distributed. Conversely, if the Sig. is less than 0.05, the data is considered not normally distributed. The Kolmogorov-Smirnov test process requires two conditions to be met: the data must be quantitative, and the test assumes that the distribution parameters being tested are known (Ramdas et al., 2017)

4. If the normality test produces typically distributed data, hypothesis testing uses the Paired sample t-test. A paired sample t-test is an analysis involving two measurements on the same subject against a particular influence or treatment (Kazungu, 2020). In the Paired sample t-test, researchers used the same sample but tested it twice. Wilcoxon signed-rank test is a non-parametric method for analyzing paired data due to two different treatments if the data distribution is abnormal, as (Pramana, 2012) explained. This method is also known as the Wilcoxon Match Pair Test.

Result

There are five hypotheses to be tested from the abnormal stock return data of FMC players; all data will be tested for normality in pairs shown on **Table 2.** before and after FMC products are launched by FMC companies in Indonesia. The normality test used is the Kolmogorov-Smirnov Test, which is more sensitive to large sample sizes (>50) and detects minor deviations from normality that may not be practically significant (Breton et al. 2008). After the normality test is carried out, the next paired test will use two methods, namely Paired T-Tests if customarily distributed and Wilcoxon Signed Rank Test if not normally distributed, to prove the previous hypothesis.

Table 2. Normality Test Abnormal Return FMC Players in Indonesia

Note	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Abnormal. EXCL Before	0.136	60	0.0077892	0.891	60	0.000
Abnormal. EXCL After	0.122	60	0.0268532	0.954	60	0.023
Abnormal. LINK Before	0.172	60	0.0001432	0.821	60	0.000
Abnormal. LINK After	0.075	60	0.2000000	0.952	60	0.020
Abnormal. FREN Before	0.117	60	0.0406681	0.907	60	0.000
Abnormal. FREN After	0.307	60	0.0000000	0.666	60	0.000
Abnormal. DSSA Before	0.086	60	0.2000000	0.977	60	0.304
Abnormal. DSSA After	0.331	60	0.0000000	0.643	60	0.000
Abnormal. TLKM Before	0.099	60	0.2000000	0.980	60	0.425
Abnormal. TLKM After	0.059	60	0.2000000	0.984	60	0.604

Based on the normality test results using Kolmogorov-Smirnov shown at **Table 2.**, it can be seen that the abnormal returns for EXCL, LINK, FREN, and DSSA stocks are not normally distributed in specific periods. For EXCL, both before 0.0077892 and after the launch of 0.0268532, the data is not normally distributed with a significance value of less than 0.05. LINK shares show that abnormal returns before launch are not normally distributed with a value of 0.0001432. Still, after launch, the data is normally distributed with a value of 0.2 based on the Kolmogorov-Smirnov test, so for LINK, it is categorized as not normally distributed; FREN shares also show that both before 0.0406681 and after launch 0.0000001, abnormal return data is not normally distributed, with all significance values far below 0.05. For DSSA, the abnormal return data is normally distributed with a value of 0.2 before launch but not normally distributed after the launch of 0.0000001, so for LINK, it is categorized as not normally distributed. Therefore, the Wilcoxon Signed Ranks Test was used for these four stock codes.

In contrast, TLKM stock showed a normal distribution for abnormal returns both before 0.2 and after the launch of 0.2, with significance values greater than 0.05 in both normality tests. This suggests that in contrast to EXCL, LINK, FREN, and DSSA, TLKM abnormal returns fulfil the normality assumption in both periods. This result is important to consider when determining the appropriate statistical method for further analysis, which is the Paired T-Test.

Table 3. Wilcoxon Signed Rank Test on Abnormal Return EXCL, LINK, FREN, DSSA

Note	Abnormal. EXCL After - Abnormal. EXCL Before	Abnormal. LINK After - Abnormal. LINK Before	Abnormal. FREN After - Abnormal. FREN Before	Abnormal. DSSA After - Abnormal. DSSA Before
Z	-0.456	-1.399	-2.598	-1.545
Asymp. Sig. (2-tailed)	0.648	0.162	0.009	0.122

Based on the results of the Wilcoxon Signed Ranks Test shown in **Table 3.** for the abnormal returns of EXCL, LINK, FREN, and DSSA stocks, several important conclusions can be drawn. This test is used to determine whether there is a significant difference between abnormal returns before and after a product launch. For EXCL, the test results show a Z value of -0.456 and a significance (Asymp. Sig.) value of 0.648, indicating no significant difference between abnormal returns before and after the launch. The LINK stock has a Z value of -1.399 with a significance value of 0.162, also indicating no significant difference. In contrast, the FREN stock shows a Z value of -2.598 and a significance value of 0.009, indicating a substantial difference between abnormal returns before and after the product launch. Lastly, the DSSA stock has a Z value of -1.545 and a significance value of 0.122, showing no significant difference in abnormal returns.

From this analysis, it can be concluded that the launch of the True Quadplay product significantly impacted the abnormal returns of FREN stock. Moreover, abnormal returns can be affected by market uncertainty and dynamic launch strategies (Cui et al., 2011). In contrast, no significant effect was detected for EXCL, LINK, and DSSA stocks. This means that the market responded more positively to the launch of the True Quadplay product for FREN stock than the other stocks. The lack of significance for EXCL, LINK, and DSSA may indicate that the product launch was not strong enough to influence investor perceptions of these stocks' values or that other factors may have been more dominant in affecting the returns of these stocks during the period in question.

Table 4. Paired T-Test on Abnormal Return TLKM

Note	Paired Differences					t	df	Significance	
	Mean	Std. Dev	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
				Lower	Upper				
Abnormal. TLKM Before - Abnormal. TLKM After	-0.002	0.015	0.002	-0.005	0.002	-0.848	59	0.20000	0.40000

The paired t-test results for the abnormal returns of TLKM before and after the product launch are shown in **Table 4.** Describe a mean difference of -0.002, with a standard deviation of 0.015 and a standard error mean of 0.002. The 95% confidence interval for the difference ranges from -0.005 to 0.002. The t-value is -0.848, with 59 degrees of freedom. The one-sided p-value is 0.2, and the two-sided p-value is 0.4.

From this analysis, we can conclude that there is no significant difference between the abnormal returns of TLKM before and after the product launch. The two-sided p-value of 0.4 is much higher than the typical significance level of 0.05, indicating that the observed mean difference is not statistically significant. This means that the product launch did not have a meaningful impact on the abnormal returns of TLKM stock. The confidence interval also includes zero, further suggesting that any observed difference could be due to random variation rather than an actual effect of the product launch.

Discussion

Product launches significantly impact abnormal returns within the framework of Efficient Market Theory (Ganbaatar et al., 2023) show that introducing innovative products can cause abnormal returns to exceed the average. In testing the abnormal stock returns of FMC companies in Indonesia, **Table 5** shows that the abnormal stock returns of the five companies that launched FMC products in Indonesia and the impact of product launches on investors' perceptions of stock value may vary based on several factors (Pauwels et al., 2004) EXCL, LINK, DSSA, and TLKM, are similar before and after the product launch. (Park & Suk, 2018) support that investors highly value new product introductions, which generate abnormal and normal returns.

Table 5. Comparison of Abnormal Returns on Shares of FMC Players in Indonesia

Note	Mean	Std. Dev	Var	Normality Test	Hypothesis Test
Abnormal Return EXCL Before	0.00239	0.01753	0.00031	Not Normally Distributed	There is no significant difference
Abnormal Return EXCL After	0.00129	0.02373	0.00056	Not Normally Distributed	
Abnormal Return LINK Before	0.00489	0.02935	0.00086	Not Normally Distributed	There is no significant difference
Abnormal Return LINK After	-0.00102	0.01968	0.00039	Normally Distributed	
Abnormal Return FREN Before	-0.00707	0.04211	0.00177	Not Normally Distributed	Significant difference
Abnormal Return FREN After	0.01232	0.04526	0.00205	Not Normally Distributed	
Abnormal Return DSSA Before	0.00053	0.03118	0.00097	Normally Distributed	There is no significant difference
Abnormal Return DSSA After	0.00830	0.04316	0.00186	Not Normally Distributed	
Abnormal Return TLKM Before	-0.00201	0.01042	0.00011	Normally Distributed	There is no significant difference
Abnormal Return TLKM After	-0.00039	0.01052	0.00011	Normally Distributed	

Most of the abnormal return data in the study period is not normally distributed based on the Kolmogorov-Smirnov test, which indicates that the distribution of abnormal returns does not follow a normal distribution due to external factors or certain market events. In cases where the data is not normally distributed, nonparametric statistical tests such as the Wilcoxon Signed-Rank Test are usually used to analyze the difference in returns before and after certain events such as stock splits (Zakiyah & Nurweni, 2020; Akbar & Baig, 2010; Hu & Ahmed, 2010).

In the launch of XL Satu's FMC product that affects EXCL and LINK shares that take strategic merger actions in launching FMC products, there is no significant difference before or after the launch of FMC products on the abnormal return of EXCL shares and LINK shares and in contrast to this phenomenon is the first-mover concept, where companies that sponsor and champion existing technologies will benefit significantly (Kim & Mazumdar, 2016). It can be seen in **Table 5** that the average abnormal return of EXCL shares and the average abnormal return of LINK shares both experienced a decrease in the average abnormal return for EXCL of -0.109% and LINK -0.591%. Although there is a decrease, this confirms that (Mann & Babbar, 2018) research confirms that abnormal returns are generated during new product announcements. According to (Firli and Rahadian, 2020), positive abnormal returns on EXCL prove that the actual return obtained is higher than the expected return

The FMC True Quadplay product launch significantly impacted the abnormal return of FREN shares, as seen in **Table 5**. Before the launch, FREN's average abnormal return was -0.00707. This figure increased to 0.01232 after the launch, indicating a very positive market response to the FMC product launch; this, (Tellis & Johnson, 2007), emphasizes the direct impact of quality on abnormal returns, which indicates a significant effect compared to other marketing events. In addition, the increase in standard deviation and variance for FREN suggests an increase in stock return volatility after the product launch, which may reflect increased uncertainty or speculation in the market. The results of the Paired T-Test statistics on FREN showed a significant difference between the abnormal returns before and after the launch, supporting the fact that the launch of True Quadplay had a considerable impact in line with the research of (Talay et al., 2019), highlighting that product launch events tend to generate greater positive abnormal returns compared to prototype events due to the commercialization aspect.

On the other hand, for DSSA shares, the True Quadplay launch showed an increase in average abnormal return from 0.00053 to 0.00830 after the launch by (Lee & Chen, 2008), who confirmed this by stating that new product announcements usually generate positive abnormal stock returns. However, this increase is not statistically significant. This suggests that the market did not respond to this product launch with the same enthusiasm as FREN shares, and the launch of True Quadplay did not significantly impact DSSA shares as it did on FREN shares.

At the launch of the FMC TelkomselOne product, Telkom, as the parent company of Telkomsel, did not experience a significant difference in abnormal stock returns; this indicates that as research (Alamsyah et al., 2019) news such as product launches such as FMC has various information that builds investor perceptions of specific companies and affects company growth but does not make a difference; this can be seen in **Table 5.** The p-value is greater than 0.05, which is 0.400. The difference before and after the launch of FMC products on the average abnormal return of TLKM shares is better because it is positive, as seen in **Table 5**, which is 0.163%; this gives a positive response from investors to the FMC strategy carried out by Telkom to develop business in the telecommunications sector in Indonesia as information from (Talay et al., 2016) emphasizes the importance of market understanding in estimating the effect of new product launches on stock returns.

Conclusion

Based on the research that has been done, it can be concluded as follows: FMC player companies in Indonesia in the research period before the launch of FMC products and after the launch of FMC products did not experience significant differences for EXCL, LINK, DSSA, and TLKM. This means that the market response to the influence of FMC strategies could be better, and the news and information are considered to have no significant impact on the movement of the share price of FMC player companies in Indonesia. FREN is the only FMC player company that has a substantial difference between before the launch of FMC True Quadplay products and after the launch of FMC True Quadplay products. FREN investors believe the FMC strategy improves stock price movements in the observed period. Of the three FMC products launched in Indonesia, only the abnormal return of TLKM shares and the abnormal return of FREN shares and DSSA shares have a positive value, which provides information that investors in TLKM, FREN, and DSSA shares have more confidence in managing the FMC business in the future in Indonesia.

Suggestions for future research: Adding trading volume variables to see whether the FMC product launch strategy affects the stock trading of companies that run the FMC strategy. Comparing the market model, mean model, and market-adjusted model methodologies shows abnormal stock returns for companies that carry out FMC strategies in Indonesia. Comparing the data of FMC companies from other countries to examine further the effect of FMC strategy on investors in stock trading.

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