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Do Foreign Investment Flow and Overconfidence Influence Stock Price Movement? A Comparative Analysis before and after the COVID-19 Lockdown

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Abstract: This study examined whether foreign investment flow and overconfidence can influence stock price movement among the publicly listed companies in Indonesia. Subsequently, this study determined whether there was any significant difference in the influence of foreign investment flow and overconfidence on stock price movement before and after the COVID-19 lockdown in Indonesia. This study focused on the manufacturing companies listed on the Indonesian Stock Exchange for the 2020 period of which the data were taken in a period of 10 days before and 10 days after the implementation of the COVID-19 lockdown in Indonesia. Using content analysis on secondary data, this study showed that there was a significant difference between the stock prices before and after the COVID-19 lockdown. However, this study showed that foreign investment flow and overconfidence were not the main factors influencing stock price movement before and after the lockdown. The findings indicate that there are other factors that contribute to stock price movement in Indonesia. This study contributes to the existing literature on whether foreign investment flow and overconfidence influence stock price movement in a pandemic world.

Keywords: foreign investment flow; overconfidence; stock price movement; COVID-19; lockdown; Indonesia

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1. Introduction

The COVID-19 pandemic has had an effect not only on the health sector but also on the economic sector all over the world (Ghani et al. 2022). Indonesia is not an exception to this situation. The Central Statistics Agency (BPS) revealed that Indonesia's economic development in the first quarter of 2020 witnessed a growth of 2.97%, which is a significant change from the 5.02% growth that was recorded in 2019. In Indonesia, the pandemic had a negative impact on the capital market including a change in trading hours on the Indonesian Stock Exchange (BEI) (Kusnandar and Bintari 2020) which, consequently, affected stock price movement. On 8 April 2020, the Combined Stock Price Index (IHSG), which shows the aggregate change in the share price of companies listed on the BEI, showed a decrease in stock prices by around 1.34% at 4704.58. However, upon the government's announcement of imposing the COVID-19 lockdown, trading hours resumed, causing a steady movement in the stock prices. The existence of unstable stock price movement results exposed investors to increasing risk and uncertainty (Kartika 2008).

During the COVID-19 pandemic, various factors have influenced stock price movement. One of the factors is foreign direct investment flow. Foreign direct investment flow represents the value of international transactions that are directly related to direct investment for a specific time period. Transactions involving shares, the reinvestment of earnings, and deals involving debt between different companies make up financial flows. Outward flows with positive inward flows are transactions that increase the investment that investors in the reporting economy have in enterprises located in a foreign economy,

such as through the purchase of equity or the reinvestment of earnings (Hayakawa et al. 2022). On the other hand, transactions that decrease the amount of money that foreign investors have invested in local businesses are considered to have negative inward flows.

Another factor that can influence stock price movement is emotion, such as investors' overconfidence (Pompian 2006). According to Bouteska and Regaieg (2020), overconfidence can be traced back to a variety of circumstances stemming from an overestimation of research. Individuals who are self-assured in their knowledge and capabilities will use the facts at their disposal to make predictions. These individuals have the mentality and belief that they will be more successful in their endeavors if they heed their own instincts rather than the recommendations of others. Overconfidence can have a substantial impact on the evaluation that individual investors use when making investment decisions, which in turn can promote stock price movement (Benos 1998). In a pandemic environment, Barberis and Thaler (2002) suggested that investors' decisions on their assets are not entirely logical; instead, they are impacted by cognitive behavior errors and emotional behavior.

This study aimed to examine the factors influencing stock price movement before and after the COVID-19 pandemic lockdown in Indonesia. Subsequently, this study determined whether there is any significant difference in the influence of foreign investment flow and overconfidence on stock price movement before and after the COVID-19 lockdown in Indonesia. Two factors were chosen, namely foreign investment flow and investors' overconfidence. The findings in this study provide a further understanding of the factors that can influence stock price movement not only in Indonesia but also throughout the world. The next section provides the relevant literature review. This is followed by Section 3, which explains the research methodology, and Section 4, which provides the results and discussion. Finally, Section 5 concludes this study.

2. Literature Review

2.1. Stock Market

The stock market refers to the public marketplaces that are available for the issuance, purchase, and sale of stocks occurring in the market at a certain time, and the stocks' value can move up and down over a certain time (Darmadji and Fakhruddin 2012). According to Jogiyanto (2008) and Machmuddah et al. (2020), stock price movement is determined by the demand and supply of the stock in the capital market and is due to events reflecting investors' decisions. That is, the impact of environmental changes can influence investors' behavior, causing stock price movement (He et al. 2020). For example, in Indonesia, during the market crash that occurred in 2008, it was stated that there was a decline in the stock market before the crisis event, but the decline was overcome because Indonesia learned from the financial crisis that occurred in 1997 (Suparman 2012). The government has launched several policies to overcome financial crises, such as suppressing the reserve requirement ratio, relaxing several accounting regulations related to asset valuation, and lowering interest rates (Titiheruw et al. 2009).

The stock market is surrounded by many factors, such as economic and non-economic factors. According to Machmuddah et al. (2020), the impact of these two factors can cause stock prices to change. Their study found that changes in stock prices are caused by various events, such as events related to company activities or incidental events. These events have different characteristics, and incidental events can occur at any time; an example is the COVID-19 pandemic, which has had a drastic impact on stock prices. In addition, stock prices are also influenced by various factors such as the condition of the company, the economic environment that affects the capital market, investor behavior, and government policies. This study aims to examine two factors, namely foreign investment flow and overconfidence, and their effect on stock price movement during the COVID-19 pandemic, especially before and after the COVID-19 lockdown in Indonesia.

2.2. Foreign Investment Flow

Foreign investment has an important role in financial mobilization and structural transformation and, hence, the use of foreign investment entering emerging markets (Ahmed and Zlate 2014). Anayochukwu (2012) explained that foreign investment is an external financial source of foreign capital that is used for the development of the country and to accelerate the growth of investment or the economy of the country concerned. It involves investments in financial assets in a country made by investors residing in another country (Gupta et al. 2013). Meanwhile, Ismail and Ismail (2021) noted that foreign investment is divided into two categories, namely foreign direct investment and foreign portfolio investment. The first category is related to cross-border investment in which investors residing in one country have significant influence over a company in another country, while the second category is related to a passive investment with high movement, for example, stocks or bonds. This study examines the foreign investment that focuses on foreign selling and foreign buying by stock investors.

Previous studies have noted the conditions that occurred during the market crash in 2008–2009 also affected the market conditions (see Titiheruw et al. 2009). Titiheruw et al. (2009) explained that, in Indonesia, most of the foreign flows switched to government securities rather than stock assets. In addition, the disposal of stocks by foreigners at that time caused a decline in foreign investment during the crisis. The decline in foreign investment was attributed to the global financial crisis itself, which also led to an increase in the cost of credit financing. On the other hand, a positive impact of the decline in foreign investment flows was attributed to the mergers and acquisitions during the crisis (Vintila 2011) as reported by the Bank Indonesia Economic Report. In 2009, the decline was caused by the 2008 global economic crisis that hit the world capital markets. However, it was reported that Indonesia's economic condition at that time was still relatively good because Indonesia had learned a lot from the previous financial crisis in 1998. In 2016, this also happened due to the impact of the US interest rate adjustment and the Brexit referendum (Poppy and Restu 2021).

The OECD has explained that foreign investment can play an important role in supporting the economy through the financial sector during the COVID-19 pandemic. As reported by a group of studies, foreign investors have a significant effect on stock market fluctuations. These studies also showed that foreign investment flows influence stock prices (Frankel and Schmukler 1996; Brennan and Cao 1997; Kang and Stulz 1997; Gupta et al. 2013). Nguyen and Le (2013) showed that foreign gross purchases, foreign gross sales, and net purchases had a significant relationship with stock market movement and there was a positive correlation with market volatility. Kim and Jo (2019) showed that foreign investors have a positive effect on stock prices. Similar findings were found by Rujiravanich (2015), who found a positive correlation between foreign net purchases and stock returns and that foreign net purchases lead to changes in stock prices. However, Hanafi (2020) found that foreign selling and foreign buying had a negative relationship with foreign investor behavior.

2.3. Overconfidence

A body of accounting literature has examined the link between overconfidence and stock prices. Overconfidence is an attitude in which individuals feel excessively self-confident. Wulandari and Iramani (2014) stated that overconfidence is exhibited by investors who exaggerate their predictions, knowledge, and abilities. Investors who experience overconfidence behavior believe too much in the valuation of the shares made by themselves (Scott et al. 2003). Kartini and Nugraha (2015) explained that overconfidence has the effect of investors overestimating and underestimating existing predictions because they will overestimate their abilities. Investors with a high level of self-confidence prefer to take risks, while rational investors will always try to maximize returns and minimize risk. Meanwhile, Cheng (2007) stated that overconfidence is a characteristic that most often appears in an individual where it represents a person's tendency to overestimate their

abilities, the likelihood of their success, the possibility that they will achieve positive results, and the good accuracy of their knowledge.

Overconfidence often arises when an individual's knowledge of something exceeds reality (Deaves et al. 2005). Bouteska and Regaieg (2020) noted that overconfidence arises from various situations; e.g., when individuals become confident in their knowledge and abilities, they tend to make forecasts from the information they have. Individuals think and believe that they will be more successful if they follow their intuition rather than listen to the advice of others. Investors also tend to seek information for self-gratification rather than justification, and the overconfident individual strongly believes that they are someone who is very lucky. Evans (2006) identified that the effect of overconfident investors is that there is too frequent stock trading that causes changes in stock prices. Odean (1998) also argued that investors who experience overconfidence behavior will be more aggressive when faced with stock trading. This is because investors who have a high level of overconfidence tend to overestimate the accuracy of their information and feel they have a better capacity than other investors in evaluating information, causing such investors to trade stocks more often than other investors (Benos 1998).

In Indonesia, during the financial crisis in 2008, investors lost their confidence and sold their shares, which then caused the Jakarta Composite Index to fall. One of the reasons for the decline in the stock prices was panic selling. Although stock prices fluctuate, the consideration of the decline in a company's profitability is one of the considerations for investors in their activities (Titiheruw et al. 2009). Shefrin and Statman (2000) stated that there is a correlation between overconfidence and stock prices, and the increase in stock price changes in the market is one of the effects of overconfident investors. Meanwhile, Glaser and Weber (2007) showed that the predictions made by investors will have a correlation with changes in stock prices and trading volume, which can then be calculated to show the behavior of these investors. Chuang and Susmel (2011) found that when stock prices become high it is because the level of confidence and optimism of investors increases. According to Jlassi et al. (2014), conditions such as the global crisis will result in the overconfidence of investors showing their decision choices through stock transactions, which can have an influence on stock price movement.

Bansal (2020) explained that overconfidence is proven to cause movement in stock prices during the COVID-19 pandemic. He stated that changes and price movement were one of the characteristics of the pandemic. Investors who have optimism over their decision choices resulted in positive behavior in responding to the lockdown (Sitinjak 2020). This could be seen when confidence in the capital market began to emerge in the midst of the pandemic and, as reported by a KSEI News report, the pandemic condition did not dampen the desire of investors to trade shares. With the optimism of investors who kept their shares or bought shares based on their own analysis, an increase in stock prices occurred in the first week of May 2020 after the decline in stock prices in March 2020 (Sitinjak 2020).

3. Indonesian Scenario of the Stock Market and COVID-19 Pandemic

In response to the COVID-19 lockdown program initiated by the Governor of DKI Jakarta on 7 April 2020, the Jakarta Stock Price Exchange (JCI) movement decreased, so the regulator had to make several policies to suppress the decline in stock prices experienced by the JCI. This is consistent with the decline in the value of foreign investment flows, which shows that foreign investors sold their share ownership ahead of the COVID-19 lockdown and gradually rose again in line with the ups and downs of foreign ownership based on the Indonesia Central Securities Depository (KSEI) data. The lockdown was carried out for two weeks, from 10 April 2020 to 23 April 2020, and, gradually, the investors were able to adapt to the existing conditions and information. Kwee (2020) reported that the optimism of individual domestic investors had increased in response to the programs run by the government and regulatory reforms from the regulator, and this resulted in optimism over the choices and trust they had, resulting in the hope that in the future they will benefit from the analysis of the decisions they made. CNBC has also reported that many investors

remained confident in investing and some investors chose to wait and paid attention when making investment decisions. This has also been reported on the official website of the Directorate General of State Assets, Ministry of Finance, which highlighted an increase in the number of investors but a decrease in the volume of transactions from 2019 to 2020.

The proportion of ownership in the Indonesian Stock Exchange is still dominated by local rather than foreign ownership. Nonetheless, there was a shift in the percentage of ownership held by non-US citizens during the fourth week of April 2020 and the first Sunday of May 2020. The KSEI reported that the share of foreign ownership appeared to be stable up to the time when the lockdown was about to be implemented, but it climbed once more when the lockdown was first put into effect. It has been reported that there was skepticism on the part of international investors over the potential effects of the pandemic as well as the preparedness of the domestic authorities to deal with the pandemic. This is demonstrated by the fact that the value of foreign investments coming into and going out of the Indonesian stock market led to price movement in the stock market. In Indonesia, even when the total number of foreign ownerships, and their trade volume, is lower than that of local ownerships, the majority of foreign ownerships are held by institutions and the majority of local ownerships are held by individuals (Rhee and Wang 2009). As the flow of foreign funds is short-term and very dynamic, it is easy to enter and exit the Indonesian capital market. This makes it possible for the proportion of foreign share ownership in the Indonesian capital market, which was described earlier, to cause fluctuations in the performance of the capital market.

The news of the lockdown in Indonesia caused the JCI to fluctuate again in the second week of April 2020, which had previously experienced a decline in March due to the news of the first case of COVID-19 in Indonesia. In addition, the Ministry of Finance explained that the implementation of the lockdown followed by several suspensions of economic activities had affected the economic sectors for the first time since the announcement of the first COVID-19 case. The lockdown was a market consideration, which means that investors could still see and consider whether the lockdown could reduce the impact of their financial choices. Gurbaxani and Gupte (2021) noted that the COVID-19 pandemic event affected investors' investment decisions, and Mamun and Griffiths (2020) showed that the pandemic affected stock price movement in the United Kingdom stock market.

4. Research Design

4.1. Sample

This study relied on the manufacturing companies in Indonesia. This study used purposive sampling in which information was obtained in the form of available data from certain target groups. This study obtained the data on the manufacturing companies from the official website of the Indonesia Stock Exchange, Yahoo Finance, Indopremiere, and the official website of Bank Indonesia. This study took the following sample criteria:

1. Manufacturing companies listed on the Indonesia Stock Exchange in the 2020 period;
2. Companies that had completed the fiscal year and issued financial statements for the 2020 period;
3. Manufacturing companies with available data in the study period.

4.2. Research Instrument and Data Collection

This study used content analysis as the research instrument. The content analysis was performed on secondary data that are publicly available to data users. The data used in this study were daily data from the 10 days before (27 March 2020–9 April 2020) and the 10 days after (27 April 2020–6 May 2020) the lockdown. Table 1 presents the data criteria used in this study.

Table 1. Data Criteria.

Item	Criteria
Manufacturing company stock price	Manufacturing stock closing price
Foreign buying and foreign selling manufacturing companies	Total foreign selling and daily foreign buying of manufacturing sector stocks
Number of shares traded	Manufacturing sector stock trading volume
Middle rate	Selling rate and buying rate of USD

4.3. Data Measurement

This study had two independent variables, namely foreign investment flows and overconfidence, and one dependent variable, namely stock prices. Table 2 presents the variable measurements used in this study. For the first independent variable, foreign investment flow, this study used the foreign investment flow assessment with the ratio of buying and selling research obtained from foreign buying and foreign selling 10 days before and 10 days after the lockdown. The data were obtained from the ipot application (Egly et al. 2010; Setiaji and Wijayanto 2019).

The second independent variable was overconfidence. Shefrin and Statman (2000) stated that the stock transaction activity of an investor is influenced by the investor's level of overconfidence and high overconfidence leads to frequent trading. Overconfidence in this study was measured by the trading volume, which was calculated to find the stock turnover rate value (Boubaker and Mariem 2013; Cherono et al. 2019). Glaser and Weber (2007) also used the stock turnover rate and showed that there was a correlation between investor overconfidence and trading volume.

This study used changes in the stock price as a measurement of stock price movement. Previous studies have used stock price changes to examine changes in stock prices before and after the event that occurred (Deaves et al. 2005; Talab et al. 2017; Panyagometh 2020). This study examined the stock price using the share price group of the manufacturing sector companies listed on the Indonesia Stock Exchange. The manufacturing sector, when viewed from Panyagometh's (2020) study, is a sector that has been quite stable during the COVID-19 pandemic. According to the Ministry of Industry of the Republic of Indonesia, the manufacturing sector is also among those that survived during the pandemic.

This study used the middle rate to represent the exchange rate. This variable was used as the control variable. The rupiah exchange rate was calculated using the USD as Listrono and Nuraina (2015) described that the USD exchange rate (USD/IDR) can affect stock prices.

Table 2. Variable Measurements.

Variable	Measurement
Foreign investment flow	Foreign investment flow
Overconfidence	Stock turnover rate
Stock price	Stock price before and after event
Exchange rate	Middle exchange rate

5. Results and Discussion

5.1. Analyses before COVID-19 Lockdown

Table 3 presents the results of the normality test before the COVID-19 lockdown. The Asymp. Sig. (two-tailed) result was 0.346, which is greater than 0.05. Therefore, it can be concluded that the data were normally distributed, or, in other words, the data passed the normality test.

Table 3. One-Sample Kolmogorov–Smirnov Test before the COVID-19 Lockdown.

		Unstandardized Residual
Normal Parameters	Mean	0.000
	Std. Deviation	0.106
Most Extreme Differences	Absolute	0.10
	Positive	0.110
	Negative	−0.103
Kolmogorov–Smirnov Z		0.935
Asymp. Sig. (2-tailed)		0.346

Table 4 presents the results of the normality test after the COVID-19 lockdown. The table shows the value of Asymp. Sig (two-tailed) to be 0.349, which is greater than 0.05. Therefore, it can be concluded that the data were normally distributed, or, in other words, the data passed the normality test.

Table 4. One-Sample Kolmogorov–Smirnov Test after the COVID-19 Lockdown.

		Unstandardized Residual
Normal Parameters	Mean	0.000
	Std. Deviation	0.096
Most Extreme Differences	Absolute	0.110
	Positive	0.106
	Negative	−0.110
Kolmogorov–Smirnov Z		0.933
Asymp. Sig. (2-tailed)		0.349

Table 5 presents the results of the paired sample *t*-test before and after the COVID-19 lockdown. The table shows the results of the statistical tests for different tests before and after the lockdown. The results show that for Pair 1, the difference in foreign investment flows before and after the lockdown with Sig. (two-tailed) was 0.3485, which is greater than 0.05. Therefore, Pair 1 showed no significant difference for foreign investment flows before and after the lockdown. The absence of a difference between foreign investment flows in this study is not consistent with the findings of Moosa and Merza (2022), who suggested that there were differences between foreign investment flows before and after the lockdown. However, although there was no difference between foreign investment flows before and after the lockdown in this study, as reported on the news portal of *The Jakarta Post* (Rahman 2020), domestic investors dominated the Indonesian stock market during the pandemic, and foreign investors, according to data from the Ministry of Finance, diverted their investments to safe assets or government bonds. In addition, as reported by the news portal of *The Jakarta Post*, many foreign investors withdrew their investment due to the uncontrolled situation, especially when the lockdown was announced to try to overcome the spread of the virus by closing several economic sectors.

In Pair 2, this study analyzed the stock turnover rate or overconfidence, resulting in a Sig. (two-tailed) value of 0.1960, which is greater than 0.05. Therefore, this study shows that Pair 2 had no significant difference for overconfidence before and after the lockdown. The absence of a difference for overconfidence in this study is not in accordance with the findings of Sitinjak (2020), who suggested an increase in investor confidence before and after the lockdown. This is consistent with the findings of Parulian and Syahwildan (2021), who explained that trading volume activity that assesses overconfidence has no difference before and after the lockdown due to the level of public confidence remaining stagnant.

For Pair 3, the stock price assessment before and after the lockdown had a Sig. (two-tailed) value of 0.0011, which is smaller than 0.05. Therefore, it was concluded that Pair 3 showed a significant difference in stock price movement before and after the lockdown.

This is in accordance with the findings of Anggraini (2021), who explained that there was a difference between stock price movement before and after the announcement of government policies related to social distancing.

Table 5. Paired Sample *t*-Test.

		Paired Differences					t	df	Sig.
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	FIF before-FIF After	16,576,264.2392	149,036,440.4149	17,564,112.9435	−18,445,582.2766	51,598,110.7551	0.9438	71.000	0.3485
Pair 2	STR before—STR After	0.0003	0.0021	0.0002	−0.0002	0.0008	1.3052	71.000	0.1960
Pair 3	OV before—OV After	0.0599	0.1493	0.0176	0.0249	0.0950	3.4071	71.000	0.0011

Note: FIF—foreign flow investment; STR—stock turnover rate; OV—overconfidence.

Table 6 presents the descriptive statistics before the COVID-19 lockdown. From the table, it can be seen that the average share price movement was 0.0004, which means that most of the stock price movement data were positive. The movement of the highest share price increase of 0.52 on Day 10, 9 April 2020, was probably due to the fact that when a publicly listed company, namely Barito Pacific Tbk (BRPT), recorded a decrease in profits and a decrease in expenses, it planned to pay off its debt by issuing bonds and decrease the minimum share price movement. The highest share price increase of 1.00 was for Sejahtera Bintang Abadi Textile (SBAT), a textile manufacturing company, on Day 2, 30 March 2020, which was probably because SBAT had just conducted an IPO and still needed time to adjust.

Table 6. Descriptive Statistics before Lockdown.

	Minimum	Maximum	Mean	Std. Deviation
Stock price before	−1.00	0.52	0.0004	0.07093
FIF before	0.00	623,100.00	2102.6093	29,386.25116
OV before	0.10	0.31	0.0027	0.01929
KURS before	14,222.00	16,741.01	16,175.9275	668.76183

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

For foreign investment flow, the average foreign investment flow was around 2102.6093 with a maximum value of 623,100 for a publicly listed company known as Arwana Citramulia (ARNA) on Day 10, 9 April 2020. Because ARNA had increased profits for its business sector, it gave investors investment prospects. The minimum value was 0, spread over Days 1–10, because no income for investment by foreign investors was recorded in the data source.

For overconfidence, the average stock turnover rate from overconfident investors was around 0.0027 with a maximum value of 0.31, namely for Klasifikasi Baku Lapangan Usaha Indonesia (KBLI) on Day 10, 9 April 2020. This is because after KBLI obtained a loan from one of the conventional banks, it registered a profit increase, so it could increase investor confidence. The minimum value was 0.10, namely for Toba Pulp Lestari Tbk PT (INRU) on Day 4, 1 April 2020. This occurred because INRU recorded a decline in sales, which was predicted to run until the end of the year, so it was possible that investors lost their confidence in investing in INRU. In determining whether panel data are better estimated using the fixed effect model (FEM) or the common effect model (CEM), the Chow test was performed by testing the following hypotheses:

H1. *Common Effect Model (CEM);*

H2. *Fixed Effect Model (FEM).*

If the probability (cross-section F) is smaller than 0.05 (Prob. < 0.05 (a)), H1 is rejected and H2 is accepted. This is also explained by the panel data; it is better to estimate using the fixed effect model (FEM). Table 7 presents the results of the Chow test and shows that the appropriate Chow test is the CEM due to the probability value of 0.5757, which is greater than 0.05.

Table 7. Chow Test.

Redundant Fixed Effect Tests **Equation: Untitled** **Test Cross-Section Fixed Effects**			
Effect test	Statistic	df	Prob.
Cross-section F	0.958479	−71.643	0.5757

In determining whether panel data are better estimated using the random effect model (REM) or the FEM, the Hausman test was carried out by testing the following hypotheses:

H3. *Random Effect Model (REM);*

H4. *Fixed Effect Model (FEM).*

If the resulting chi-square is smaller than 0.05, the hypothesis H3 is rejected and H4 is accepted, which can also explain that panel data are better estimated using the FEM. Table 8 presents the results of the Hausman test. The results of the Hausman test explain that the REM is better than the FEM, as the results show the chi-square probability value of 1.0000, which is greater than 0.05.

Table 8. Hausman Test.

Correlated Random Effects—Hausman Test			
Equation: Untitled **Test Cross-Section Random Effects**			
Test Summary	Chi-Sq. Statistic	df	Prob.
Cross-section random	0.000000	3	1.0000

In determining whether the panel data are better estimated using the CEM or the REM, the Lagrange test was carried out. If the resulting *p* value is greater than 0.05, then the hypothesis Ho is accepted and Ha is rejected. Table 9 presents the results of the Lagrange test. The results of the Lagrange test explain that the CEM is better than the FEM, as the results show that the *p* value is 0.9335, which is greater than 0.05.

Table 9. Lagrange Multiplier (LM) for Panel Data.

Null (No Rand. Effect)	**Cross-Section**	**Period**	**Both**
Alternative	**One-Sided**	**One-Sided**	
Breusch–Pagan	0.006971 (0.9335)	0.033342 (0.8551)	0.040313 (0.8409)

The multicollinearity test was used in this study to test the existence of a very strong relationship condition between several or all of the independent variables involved in the regression model. If there is multicollinearity, then there is a bias in the regression coefficient. In panel data regression analysis, the VIF value is seen to determine whether

there is multicollinearity. Based on the results of the multicollinearity test for the post-pandemic data, all dependent variables showed a VIF value below 10.0 and a 1/VIF value above 0.1, indicating that the regression model did not experience multicollinearity problems. Table 10 presents the results of the multicollinearity test.

Table 10. Multicollinearity Test.

Variable	VIF	1/VIF
FIF	1.003	0.996821806
OV	1.002	0.998456251
KURS	1.004	0.99579976

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

The heteroscedasticity test was used to test whether the residual variance from one security datum to another observation remains. This test was performed using the Park test, which has the following criteria:

1. If prob. > 5% (0.05), then there is no symptom of heteroscedasticity;
2. If prob. < 5% (0.05), then heteroscedasticity occurs.

Table 11 presents the results of the Park test. From the results of the Park test, it can be seen that the probability of each variable is >5% (0.05). Hence, it can be concluded that there were no symptoms of heteroscedasticity.

Table 11. Park Test.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIF	−0.879847	1.246.914	−0.070562	0.9438
OV	−2,728,236	18,989,013	−0.143674	0.8858
KURS	5.365.980	5.479.429	0.097930	0.9220
Constant	−492,317.3	8,871,031	−0.055497	0.9558

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

Table 12 presents the results of the panel data regression before the COVID-19 lockdown. The results show that a constant (a) of −30.43313 is the predicted value of the stock price when the simultaneous or joint effect of foreign investment flow, overconfidence, and the exchange rate is 0 (zero). The regression coefficient for foreign investment flow was −0.0000543and had a negative value. This means that every time there is an increase in the value of foreign investment flow, with the other independent variables assumed to be constant, it is predicted that the stock price will decrease by −0.0000543.

Table 12. Panel Data Regression.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIF	−0.0000543	0.000770	−0.070476	0.9438
OV	−168.3404	1173.378	−0.143467	0.8860
KURS	0.003314	0.033859	0.097890	0.9220
Constant	−30.43313	548.1627	−0.055518	0.9557
R-squared	0.000049	Mean dependent var		2.260.472
Adjusted R-squared	−0.004153	S.D. dependent var		6.056.982
S.E. of regression	6.069.545	Akaike info criterion		1.566.034
Sum squared residual	0.0000000263	Schwarz criterion		1.568.584
Log likelihood	−5.618.062	Hannan–Quinn criteria		1.567.018
F-statistic	0.011630	Durbin–Watson stat		1.113.128
Prob(F-statistic)	0.998283			

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

The regression coefficient for overconfidence was −168.3404 and had a negative value. This means that every time there is an increase in the value of overconfidence, with the other independent variables assumed to be constant, it is predicted that the stock price will decrease by −168.3404. The regression coefficient for the exchange rate was 0.003314 and had a positive value. This shows that every time there is an increase in the exchange rate value, with the other independent variables assumed to be constant, it is predicted that the share price will increase by 0.003314. The regression equation formed is as follows:

$$\text{Stock price} = -30.43313 + -0.0000543 \text{ foreign flow investment} + -168.3404 \text{ Overconfidence} + 0.003314 \text{ Rate} + \varepsilon. \quad (1)$$

5.2. Analyses after COVID-19 Lockdown

Table 13 presents the descriptive statistics after the COVID-19 lockdown. From the table, it can be seen that the average share price movement was 0.0003, which means that most of the stock price movement data were positive. The highest movement of the stock price was an increase of 0.13, which was for Semen Indonesia (Persero) Tbk PT (SMGR) on Day 10, 9 April 2020, and was likely achieved because SMGR still recorded a positive sales performance during that period. The highest stock price movement of −0.28, namely for MBTO, was on Day 10, 9 April 2020. This happened in the prediction because during sales growth, MBTO still recorded losses from the previous period.

The average foreign investment flow was around 313,778.3029 with a maximum value of 37,949,900, namely for Ashland Inc. (ASII), Jakarta, Indonesia on Day 5, 2 April 2020. This was probably due to investor interest related to the news about one bank owned by Astra that was acquired by a Thai bank. The minimum value was 0 because no income for investment by foreign investors was recorded in the data source. For overconfidence, the average stock turnover rate from overconfident investors was around 0.0013 with a maximum value of 0.11, namely for Buyung Poetra Sembada Tbk (HOKI) on Day 4, 1 April 2020. This was likely because, during that period, HOKI recorded a positive performance, resulting in an increase in sales and profits that triggered investors to invest. The minimum value was 0, which included 37 out of 72 companies, spread over Days 1–10.

Table 13. Descriptive Statistics After Lockdown.

	Minimum	Maximum	Mean	Std. Deviation
Stock price after	−0.28	0.13	0.0003	0.03967
FIF after	0.00	37,949,900.00	313,778.3029	2,272,546.20501
OV after	0.00	0.11	0.0013	0.00572
KURS after	14,936.00	15,591.01	15,187.8030	216.61018

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

The results of the Chow test in Table 14 explain that the CEM is better than the FEM, as the results show that the probability value of 0.2622 is greater than 0.05.

Table 14. Chow Test.

Redundant Fixed Effect Tests Equation: Untitled Test Period Fixed Effects			
Effect Test	Statistic	df	Prob.
Period F	1.230741	−11.705	0.2622

The Hausman test was carried out to determine whether panel data are better estimated using the random effect model (REM) or the fixed effect model (FEM). The results are shown in Table 15. The results of the Hausman test explain that the REM is better than the REM, as the results show that the probability value of the chi-square is 1.0000, which is greater than 0.05.

Table 15. Hausman Test.

Correlated Random Effects—Hausman Test Equation: Untitled Test Period Random Effects			
Test Summary	Chi-Sq. Statistic	df	Prob.
Period random	0.000000	3	1.0000

The Lagrange test was carried out to determine whether the panel data are better estimated using the CEM or the REM. Table 16 shows that the REM is better than the CEM. This is because the results of the test show that the *p* value is 0.0000, which is less than 0.05.

Table 16. Lagrange Test.

Lagrange Multiplier (LM) Test for Panel Data			
Null (No Rand. Effect)	**Cross-Section**	**Period**	**Both**
Alternative	One-sided	One-sided	
Breusch–Pagan	37.15723 (0.0000)	14.55607 (0.0001)	51.71330 (0.0000)

Table 17 shows the results of the multicollinearity test for the post-pandemic data. All dependent variables showed a VIF value below 10.0 and a 1/VIF value above 0.1, indicating that the regression model did not experience multicollinearity problems.

Table 17. Multicollinearity Test.

Variable	VIF	1/VIF
FIF	1.007	0.993111
OV	1.001	0.998604
KURS	1.008	0.991779

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

Table 18 shows the results of the heteroscedasticity test. From the results of the Park test, it can be seen that the probability of each variable is >5% (0.05). Hence, it can be concluded that there were no symptoms of heteroscedasticity.

Table 18. Heteroscedasticity Test.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIF	−0.0000000000211	0.0000000000386	−0.546455	0.5849
KURS	0.00000692	0.00000643	1.075.316	0.2826
OV	0.0000832	0.039795	0.002090	0.9983
Constant	−0.103163	0.096949	−1.064.097	0.2876

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

Table 19 provides the results of the panel data regression before the lockdown. The results show a constant (a) of −30.43313 is the predictive value of the stock price when the simultaneous or joint effect of foreign investment flow, overconfidence, and the exchange rate is 0 (zero). The regression coefficient for foreign investment flow was −0.0000543, and had a negative value. This indicates that every time there is an increase in one foreign investment flow value, with the other independent variables assumed to be constant, it is predicted that the stock price will decrease by −0.0000543.

For overconfidence, the regression coefficient was −168.3404 and had a negative value. This indicates that every time there is an increase in one overconfidence value, with the other independent variables assumed to be constant, it is predicted that the share price will

decrease by −168.3404. The regression coefficient for the exchange rate was 0.003314 and had a positive value. This shows that every time there is an increase in the exchange rate value, with the other independent variables assumed to be constant, it is predicted that the stock price will increase by 0.003314.

Table 19. Panel Data Regression before Lockdown.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIF	−0.0000543	0.000770	−0.070476	0.9438
OV	−168.3404	1173.378	−0.143467	0.8860
KURS	0.003314	0.033859	0.097890	0.9220
C		548.1627	−0.055518	0.9557
R-squared	0.000049	Mean dependent var		2.260.472
Adjusted R-squared	−0.004153	S.D. dependent var		6.056.982
S.E. of regression	6.069.545	Akaike criterion		1.566.034
Sum squared residual	0.0000000268	Schwarz criterion		1.568.584
Log-likelihood	−5.618.062	Hannan–Quinn criterion		1.567.018
F-statistic	0.011630	Durbin–Watson criterion		1.113.128
Prob(F-statistic)	0.998283			

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

Table 20 provides the results of the panel data regression after the COVID-19 lockdown. The results show that the constant (a) of 0.113061 is the predictive value of the stock price when the simultaneous or joint effect of foreign investment flow, overconfidence, and the exchange rate is 0 (zero). The regression coefficient for foreign investment flow was −0.000000000424 and had a positive value. This means that every time there is an increase in the foreign investment flow value, with the other independent variables assumed to be constant, it is predicted that the stock price will increase by −0.000000000424.

Table 20. Panel Data Regression After Lockdown.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIF	−0.000000000424	0.000000000664	−0.638562	0.5233
OV	−0.229183	0.312026	−0.734498	0.4629
KURS	−0.00000736	0.00000795	−0.925254	0.3551
C	0.113061	0.120687	0.936814	0.3492
Effect Specification				
			SD	Rho
Period random			0.002713	0.0039
Idiosyncratic random			0.043314	0.9961
Weighted Statistics				
R-squared	0.002530	Mean dependent var		0.000782
Adjusted R-squared	−0.001650	S.D. dependent var		0.043290
S.E. of regression	0.043325	Sum squared residual		1.343.996
F-statistic	0.605304	Durbin–Watson stat		1.857.145
Prob(F-statistic)	0.611702			
Unweighted Statistics				
R-squared	0.002459	Mean dependent variable		0.000869
Sum squared residual	1.348.993	Durbin–Watson statistics		1.856.778

Note: FIF—foreign investment flow; OV—overconfidence; KURS—exchange rate.

The regression coefficient for overconfidence was −0.229183 and had a negative value. This means that every time there is an increase in the value of overconfidence, with the other independent variables assumed to be constant, it is predicted that the stock price will decrease by 0.139. The regression coefficient for the exchange rate was −0.00000736 and had a negative value. This shows that every time there is an increase in the exchange rate value, with the other independent variables assumed to be constant, it is predicted that the stock price will decrease by −0.00000736.

The results further show that foreign investment flow both before and after lockdown did not have a significant effect and showed a negative value on stock prices (−0.0000528 and −0.000000000424). However, the findings in this study are not consistent with the findings of previous studies such as those by Kim and Jo (2019) and Gupta et al. (2013) that suggested a positive and significant relationship between foreign investment flows and stock prices. Similarly, Rujiravanich (2015) found a positive relationship between foreign flows and stock prices from the stock market in Thailand after the Asian Financial Crisis. Alawi (2019) stated that there was no significant relationship between foreign investment flows and stock price movements. This was probably due to disruptions in the exchange rate association and global trading conditions in Saudi Arabia. In this regard, Rahman (2020) explained that domestic investors dominated the Indonesian stock market during the pandemic, and foreign investors, according to data from the Ministry of Finance, shifted their investments to safe assets or government bonds. This transfer was carried out because foreign investors had considered the risks that occurred during uncertain times, such as this pandemic.

The regression analysis in this study shows that overconfidence both before and after the lockdown did not have a significant effect and showed a negative value on stock prices (−1.636773 and −0.229183). The effect of overconfidence before and after the lockdown in this study is not consistent with the findings of previous studies such as those by Gasteren (2016) and Machmuddah et al. (2020) that suggested a positive and significant relationship between overconfidence and stock prices. However, although it has no effect, the tendency of a negative relationship between overconfidence and stock prices in this study is in accordance with previous findings (Tsai et al. 2022) showing that stock prices and overconfidence had a negative relationship. This is based on the fact that if the stock price is low, there is a high level of overconfidence, and if the stock price rises, there is a low level of overconfidence. Similar findings were found by Phan et al. (2020), who stated that there was no evidence of the effect of overconfidence on the stock market in Thailand due to a lack of a solid stock market there and a weak market shape.

In terms of the interaction effect between foreign investment flow and overconfidence on stock price movement before the lockdown, the results showed R_2 = 0.00049 before the lockdown and 0.002530 after the lockdown, supporting the earlier results in this study that showed foreign investment flow and overconfidence do not influence stock prices. The calculated F value of foreign investment flow and overconfidence before the lockdown was 0.011168 with a significance of 0.998384 where the calculated f value was smaller than the f table of 2.617, and a significance of 0.998384 is greater than 0.05. Hence, it can be concluded that foreign investment flow and overconfidence had no simultaneous effect on the stock prices before lockdown. The calculated F value of foreign investment flow and overconfidence on the stock price after the lockdown was 0.605304 with a significance of 0.611702 where the calculated f value was smaller than the f table of 2.617, and a significance of 0.611702 is greater than 0.05, so it can be concluded that foreign investment flow and overconfidence had no simultaneous effect on stock prices after the lockdown.

6. Conclusions

This study examined whether foreign investment flow and overconfidence influenced stock price movement before and after the COVID-19 lockdown in Indonesia. This study focused on the manufacturing companies listed on the Indonesian Stock Exchange for the 2020 period of which data were taken in a period of 10 days before and 10 days after

the implementation of the COVID-19 lockdown in Indonesia. The findings indicate that foreign investment flow and overconfidence are not significant factors contributing to stock price movement in Indonesia. This study showed no significant difference in the effect of foreign investment flow and overconfidence on stock prices before and after the lockdown. However, there was a significant difference in the stock prices before and after the lockdown. The findings provide understanding to investors on the factors that need to be considered when making investment decisions; i.e., investors do not need to spend so much time considering foreign investment flow and overconfidence when making investment decisions.

This study is not without limitations. First, the scope of this study was limited only to manufacturing companies. Therefore, future research can extend this study by examining the effect of foreign investment flow and overconfidence on stock price movement using other types of industries. Secondly, this study focused on Indonesian data; hence, the generalizability of the findings in this study may not be appropriate for other countries. Future research can perhaps extend this study by performing a comparative analysis between countries in order to determine whether similar findings exist. Finally, the data analyses performed in this study were limited to regression analysis and the paired *t*-test using panel data. Future research may use other types of data analysis such as value at risk (VAR) in order to provide more robust findings. The findings of this study provide benefits to researchers for further research, where the ideas and results of this study can be used as a reference. In addition, the findings of this study provide assistance for investors in the stock market to understand foreign investment flows and overconfidence behavior and to help them minimize the risk of these factors.

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