



IPO Performance: Does It Improve Post-COVID-19?

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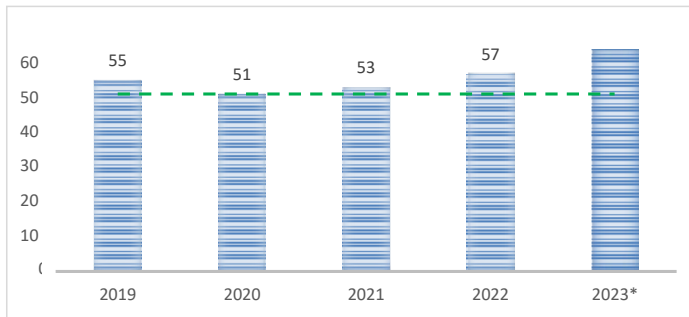
Abstract. This research aims to analyze how COVID-19 affects Initial Public Offering (IPO) performance by comparing the data consisting of 37 cases during COVID-19 and 25 cases post-COVID-19 using the independent sample t-test. The results show that the share offering rate and trading volume experienced a significant increase post-COVID-19 pandemic, while the issue price and issue size experienced a significant decrease instead. In addition, initial return and underpricing did not show any significant changes post-COVID-19 pandemic.

Keywords: COVID-19; Initial Public Offering (IPO); Issue Price; Issue Size; Initial Return; Share Offering Rate; Trading Volume; Underpricing.

1 Introduction

Economic activity significantly slowed after, on January 30, 2020, and March 11, 2020, respectively, the World Health Organization (WHO) proclaimed COVID-19 a Public Health Emergency of International Concern (PHEIC) and a pandemic. Due to the implementation of quarantine or lockdown policies to slow down the spread of the pandemic, economic activity has become minimal, which increases the risk of mass unemployment and business failure (Zhang et al., 2020). According to Barro et al. (2020), it is thought to be the root of the current global economic downturn, which swiftly spread to the financial markets (Ramelli & Wagner, 2020; Nurwulandari & Melati, 2020) and resulted in the decrease of stock market indexes and the increase of volatility (Ilbasemis, 2023).

According to World Bank figures, the global GDP decreased by 3.3% in 2020 compared to 2019 (The World Bank, 2023). Between February and March 2020, the CBOE Volatility Index (VIX) increased by more than 340% [PwC, 2020]. IPO activity has sharply accelerated despite the global economy and financial markets collapse. The PwC Global IPO Watch reports that between 2020 and 2021, IPO activity increased by 36.9% and 89.4%, respectively. However, as shown in Figure 1, the number of IPOs contradictorily experiences fluctuative movement in the Indonesian market. In 2020, the number of IPOs decreased from 55 to 51, then increased to 53, 57, and 64 in 2021, 2022, and 2023 respectively. It shows that the Indonesian market experienced insignificant changes with a slight increasing trend during the pandemic compared to those experienced worldwide.



Source: Indonesia Stock Exchange, 2023

Fig. 1. IPOs in Indonesia in 2020-2023

Although a growing stream of empirical literature focuses on IPO activity during the global pandemic, relatively few studies focus on the aftermath timeline, i.e., after COVID-19 status as WHO declared over PHEIC on May 5, 2023. It occurs because by the time this research is underway, the declaration was only made a few months prior, so the topic remains relatively unexplored. Therefore, we offer new perspectives in this research, focusing on IPO performance post-COVID-19 pandemic, specifically in the context of the Indonesian market. Share offering rate, issue price, issue size, initial return, underpricing, and trading volume will be used to measure IPO performance.

The percentage of shares offered to the public reflects the company's private information. In general, the more shares offered, the greater the potential for liquid stock trading on the stock exchange, but on the other hand, the private information held by the company and the current shareholders will be smaller (Ningrum & Widiastuti, 2017). It will increase the number of shareholders who can control the company and increase future uncertainty. Additionally, the availability of more stocks for subscription will lessen investor demand. (Low & Yong, 2011). Large issue sizes may also indicate that the company needs more funds, which can be related to its financial difficulties (Rasyad et al., 2022). As a result, issue prices will typically be lower, and underpricing levels will be higher (Herawati et al., 2017). The COVID-19 pandemic will further worsen the level of uncertainty. The company will experience more significant listing gains (Kuswanto, 2021; Mazumder & Saha, 2021; Surana, 2021) and greater underpricing (Baig & Chen, 2021; Ilbasemis, 2023). The heavily discounted issue prices during the pandemic will also attract more investors to buy the shares so that the trading volume will experience an increase (Kubiczek & Tuskiewicz, 2022).

On the contrary, Leow and Lau (2018) found that IPO initial returns would generally be lower during the crisis. They have caused the underpricing to be lower during the COVID-19 pandemic. Even Hadiwidjaja et al. (2021) and Loberg and Haugdal (2021) only found insignificant changes in initial return and underpricing during the pandemic. The negative initial return will indirectly support Apergis et al. (2023) finding, which shows that the pandemic shocks negatively impact liquidity, while the insignificant return will indirectly support Ilbasemis's (2023) finding, which reveals that the total traded volume on the initial day only experienced an insignificant change during the pandemic.

Research gaps based on related empirical literature show the increasing need for research on IPO performance post-COVID-19 pandemic, especially in the Indonesia Stock Exchange as one of the top emerging stock markets in Asia and arguably one of the best performers in Southeast Asia, which, according to Nikkei Asia (2023) accounted for more than half of the total IPOs in Southeast Asia during the COVID-19 pandemic. This research makes at least two contributions. For it to serve as a reference in related literature, this research contribution is the first to assess IPO performance in the Indonesian market following the COVID-19 epidemic. Second, this work contributes to the pandemic and crisis research and studies, particularly in the area of capital markets. The findings of this study can help stakeholders and authorities involved in Indonesian IPO activities, particularly when handling investment activities.

2 Hypothesis Development

2.1 Agency theory

According to Anthony and Govindarajan (2005), agency theory assumes that individuals are highly motivated to pursue their interests. It may create conflicts of interest between the principal and the agent. The disparity between investors with much information and those with little to no information about the company's prospects and conditions in the future might cause information asymmetry (Gao et al., 2008). The impact on future uncertainty for the corporation will be more and more information asymmetry, resulting in more underpricing (Beatty & Ritter, 1986).

2.2 Signaling theory

Morris (1987) states that based on signaling theory, sending information signals to another party from other parties can reduce information asymmetry. Leland and Pyle (1977) state that signaling is an action to deliver information to prospective investors. Existing owners are motivated to be able to voluntarily disclose private company information because the information can be interpreted and captured as a positive signal regarding the assessment of the company's performance, which can further reduce information asymmetry and have implications for lowering the level of uncertainty in the future. The degree of underpricing decreases with decreasing levels of future uncertainty.

An information asymmetry might lead to the underpricing phenomenon. Information asymmetry can cause imperfect information dissemination and make it difficult for investors to forecast the company's future. Companies' issuance of prospectuses can reduce information asymmetry. The prospectus for the company in question offers a variety of financial and non-financial details that can be utilized to identify potential influences on the amount of stock underpricing. This information can help investors with any decisions involving the risk of the value of the shares offered by the company (Kim et al., 1995).

The percentage of shares offered to the public reflects the company's private information. In general, the more shares offered, the greater the potential for liquid stock trading on the stock exchange, but on the other hand, the private information held by the company and the current shareholders will be smaller (Ningrum & Widiastuti, 2017). It will increase the number of shareholders who can control the company and increase future uncertainty. The COVID-19 pandemic will further worsen the level of uncertainty. The company will reduce the number of shares initially offered to minimize the uncertainty during the global pandemic and ensure that the issue price will not be discounted further. In contrast, the company may increase the number of shares initially offered post-pandemic due to the decreasing level of uncertainty.

Hypothesis 1: Share offering rate increased significantly post-COVID-19 pandemic.

Dasgupta et al. (2010) found that information asymmetry is more pronounced in newly listed firms because the availability of information is more remarkable for older firms. An increase in information asymmetry will influence a decrease in stock prices (Kelly & Ljungqvist, 2012). In turn, this will lead to a tendency for stock prices to become cheaper, with the implication of increasing the level of underpricing (Herawati et al., 2017). The COVID-19 pandemic's disruption will make information asymmetry more severe and the expense of sharing information about a firm's genuine value more expensive. It will lead IPO firms to offer heavy discounts on the issue price to encourage investors to participate in the IPO process during the pandemic. In contrast, the initial issue price post-pandemic will not need to be heavily discounted because the uncertainty level has decreased significantly.

Hypothesis 2: Issue price increased significantly post-COVID-19 pandemic. Surana (2021) states that IPOs performed well during the pandemic with higher issue sizes. Low and Yong (2011) explain that the limited availability of the number of stocks to subscribe to will boost investor demand on the issue. Conversely, investors will reduce demand if the availability of shares ordered is too much (Tajuddin et al., 2015). Excessive issue size will reduce the level of demand for these shares from investors (Mehmood et al., 2020). This negative relationship is because investors will indicate that the company is experiencing financial difficulties and needs large amounts of issue size (Rasyad et al., 2022). The company will decrease the issue size to reduce the uncertainty during the COVID-19 pandemic, so the issue price will not be discounted further. In contrast, the company may increase the issue size post-pandemic due to the decreasing level of uncertainty.

Hypothesis 3: Issue size increased significantly post-COVID-19 pandemic. Surana (2021) found that IPOs benefited well during the pandemic and saw greater listing gains. The

research done by Kuswanto (2021) in the Indonesian market also revealed that the returns on the listing day were excellent during the pandemic. Mazumder and Saha (2021) state that the initial return adversely correlates with pandemic fear. It is mainly caused by the underpricing due to the discount on the issue price. On the contrary, Kuswanto (2021) explains that when the fear sentiment is non-zero, its impact on the newly listed firms is more pronounced. It indicates that the initial return may decrease significantly post-COVID-19 pandemic due to the less discounted issue price and the decreasing level of uncertainty.

Hypothesis 4: Initial return decreased significantly post-COVID-19 pandemic.

According to Baig and Chen (2021), there was significantly greater underpricing on IPOs following the pandemic declaration. Ilbasemis (2023) also proves severe underpricing during COVID-19 and a significant positive relationship between underpricing and COVID-19. It occurs because firms that went public during the pandemic face more uncertainty than those that went public post-pandemic, so they offer larger discounts on the issue prices. A similar finding by Li et al. (2018) revealed that the IPO stock prices were less underpriced in the post-crisis period. It meets the criteria outlined in Ritter's (1984) and Beatty's (1986) IPO underpricing theories.

Hypothesis 5: Underpricing decreased significantly post-COVID-19 pandemic. Kubiczek and Tuzkiewicz (2022) found a U-shaped intraday distribution of transaction numbers, emphasizing the significance of the first and last minutes of the trading session. The average percentage change between transactions on the Warsaw Stock Exchange increased during the pandemic. It mainly occurs because the heavily discounted issue prices during the pandemic will attract more investors to buy the shares. In contrast, the less discounted issue price post-pandemic will make investors less encouraged to buy the shares, so that the trading volume will experience a significant decrease.

Hypothesis 6: Trading volume decreased significantly post-COVID-19 pandemic.

3 Data and Methodology

The population used in this research comprises companies that conducted an IPO in 2020–2023. The data was obtained from the official websites of the Indonesia Stock Exchange and Yahoo Finance. The population was then classified into two groups, namely the group of companies that conducted an IPO during the COVID-19 pandemic from January 10, 2020, to May 4, 2023, and the group of companies that conducted an IPO post-COVID-19 pandemic from May 5, 2023, to August 28, 2023. Based on these criteria, the population consisted of 197 IPO cases during the pandemic and 25 IPO cases post-pandemic. To avoid outliers and reduce the sample size, only those recorded on the main board were chosen as samples for the pandemic group, resulting in 38 cases. Because one company did not have a complete prospectus, the number of samples for the post-pandemic IPO group was 37 cases.

An independent sample t-test through SPSS compares IPO performance during and after the COVID-19 pandemic. The data was first tested for normality and homogeneity using the Kolmogorov-Smirnov and Levene's tests. This research measured IPO performance using nine variables: share offering rate, issue price, issue size, initial return, underpricing, and trading volume. The details of all variables used in this research can be seen in the table below.

Table 1. Description of Variables

Variables	Description
Period	0 if the IPO was done during the COVID-19 pandemic, and 1 if the IPO was done post-COVID-19 pandemic
Share offering rate	The percentage of shares offered by a company to the public from the total issued and fully paid capital
Issue price	Initial public offering price
Issue size	The natural logarithm of the share offering rate multiplied by the issue price
Initial return	The percentage difference between the adjusted close price of shares on the initial listing day and the issue price divided by the issue price
Underpricing	0 if overpricing, i.e. the initial return is negative, and 1 if underpricing, i.e. the initial return is positive

Trading volume	The natural logarithm of the total volume of shares traded on the initial listing day
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4 Result

Descriptive statistics of IPO performance based on Table 2 show that since the COVID-19 breakthrough on January 10, 2020, newly listed companies in the Indonesia Stock Exchange have offered 17.26% shares on average from the total issued. Furthermore, fully paid capital with an average issue price of Rp427.29, ranging from Rp90.00 to Rp3,080.00, and an average issue size of e26.32, equal to Rp269,544,679,400. Companies gained 14.22% in initial returns on average, ranging from -16.67% to 95.00% from the underpricing affected by the COVID-19 shock, and attracted 58,820,441.68 (e17.89) in average trading volume on the initial listing day.

Table 2. Descriptive Statistics of IPO Performance

Variables	Obs.	Mean	Std. Deviation	Minimum	Maximum
Share offering rate (%)	62	17.26	6.22	4.00	3.00
Issue price	62	427.29	537.34	90.00	3080.00
Issue size	62	26.32	1.51	23.98	30.54
Initial return (%)	62	14.22	18.78	-16.67	95.00
Underpricing	62	0.76	0.43	0.00	1.00
Trading volume	62	17.89	3.11	8.01	21.78

Source: Author work, based on data process with SPSS

Newly listed firms in the Indonesia Stock Exchange experienced an increase of 38.17% and 9.71% in share offering rate and trading volume post-COVID-19 pandemic. On the contrary, issue price, issue size, and initial return experienced decreases of 63.80%, 4.11%, and 17.84%, respectively. However, the decrease in issue price does not cause any change in initial return and underpricing, contrary to the underpricing theory in some well-known literature (Beatty & Ritter, 1986; Ljungqvist & Wilhelm, 2003; Ritter, 1987; Rock, 1986). Based on the samples analyzed, 28 out of 37 (75.68%) newly listed firms experienced underpricing during the COVID-19 pandemic, while 19 out of 25 (76.00%) newly listed firms experienced underpricing post-COVID-19 pandemic. The details of the data can be seen in Table 3 below.

Table 3. Means During and Post-COVID-19 Pandemic

Variables	During COVID-19		Post-COVID-19		Changes (%)
	Obs.	Mean	Obs.	Mean	
Share offering rate (%)	37	14.96	25	20.67	38.17
Issue price	37	575.30	25	208.24	-63.80
Issue size	37	26.76	25	25.66	-4.11
Initial return (%)	37	15.32	25	12.58	-17.84
Underpricing	37	0.76	25	0.76	0.00
Trading volume	37	17.22	25	18.89	9.71

Source: Author work, based on data process with SPSS

After qualifying the normality assumption based on the Kolmogorov-Smirnov Test, the data was tested using the Independent Sample T-test, paying attention to the homogeneity assumption based on Levene's Test. The result of the T-Test can be seen in Table 4 below.

Table 4. The Results of the Independent Sample T-Test

Variables	t	Sig.	Mean Difference	Std. Error
Share offering rate (%)	3.9350	0.0000	5.7010	1.4490
Issue price	-3.1020	0.0030	-367.0570	118.3460
Issue size	-2.9870	0.0040	-1.0995	0.3681
Initial return (%)	-0.5590	0.5780	-2.7322	4.8886

Underpricing	0.0290	0.9770	0.0030	0.1130
Trading volume	2.4290	0.0190	1.6709	0.6880

Source: Author work, based on data process with SPSS

The results show that newly listed firms post-COVID-19 pandemic experienced significant increases in share offering rate and trading volume, respectively, averaging from 14.96% to 20.67% and from 30,098,924.55 (e17.22) to 159,890,537.7 (e18.89). In contrast, issue price and issue size experienced a significant decrease post-COVID-19 pandemic, respectively averaging from Rp575.30 to Rp208.24 and from 418,523,969,500 (e26.76) to 139,314,527,300 (e25.66). In addition, initial return and underpricing did not show any significant changes after the COVID-19 pandemic. However, there was a slight negative change in the initial return, i.e., from 15.32% to 12.58%, while underpricing was constant at 0.76.

5 Discussion

The share offering rate increased significantly post-COVID-19 pandemic because, according to Ningrum and Widiastuti (2017), the percentage of shares offered to the public reflects the private information the company has. In general, the more shares offered, the greater the potential for liquid stock trading on the stock exchange, but on the other hand, the private information held by the company and the current shareholders will be smaller. It will increase the number of shareholders who can control the company and increase future uncertainty. The COVID-19 pandemic will further worsen the level of uncertainty. The company reduced the number of shares initially offered to minimize the uncertainty during the global pandemic and ensure that the issue price would not be discounted further. In contrast, the company increased the number of shares initially offered post-pandemic due to the decreasing level of uncertainty.

According to this research, issue prices experienced a significant decrease post-COVID-19 pandemic. It aligns with the result found by Leow & Lau (2018), which revealed that during the crisis, IPO initial returns would be lower in general, which means the issue price would be higher in a crisis than in a non-crisis situation, *ceteris paribus*. The significant decrease in issue price occurs because of the significant increase in share offering rate post-COVID-19 pandemic, which increases the number of shareholders who can control the company and increases future uncertainty. According to Low & Yong (2011), the availability of more stocks to subscribe to will decrease investor demand. A large issue may also indicate that the company needs more funds, which can be related to its financial difficulties (Rasyad et al., 2022). Kelly and Ljungqvist (2012) explain that stock prices fall as the asymmetry of information increases. It shows that the end of COVID-19 will worsen information asymmetry because there is a chance that other external shocks could arise that the market will not be able to predict immediately.

The significant decrease in issue price post-pandemic due to the significant increase in share offering rate will lead to a significant decrease in issue size, as has been proven in this research. These findings align with Surana's (2021) finding, which shows that IPOs performed well with higher issue sizes during the pandemic than non-pandemic ones. Previous research reinforces these findings that issue size negatively affects oversubscriptions or share demand (Tajuddin et al., 2015). The smaller the company issues shares, the greater the demand for shares (Mehmood et al., 2020).

The research failed to find significant changes in initial return and underpricing in the newly listed firms post-COVID-19 pandemic. This outcome contradicts the underpricing theory in some well-known literature (Beatty & Ritter, 1986; Ljungqvist & Wilhelm, 2003; Ritter, 1987; Rock, 1986). This research also denied the results found by Surana (2021), Kuswanto (2021), and Mazumder and Saha (2021), which show that the company experienced greater listing gains during the pandemic; the result found by Leow & Lau (2018), which shows that during the crisis, IPO initial returns would be lower in general; and the result found by Baig & Chen (2021) and Ilbasmis (2023), which revealed that the COVID-19 pandemic attracted greater underpricing. However, this result supports the findings of Hadiwidjaja et al. (2021) and Loberg and Haugdal (2021), which revealed insignificant changes in initial return and underpricing during the pandemic.

In the context of initial return, measured by calculating the difference between the adjusted close price of shares on the initial listing day and the issue price divided by the issue price, the significant decrease in the issue price may not cause a significant change in initial

return. It is because the adjusted close price was not constant, so the *ceteris paribus* assumption was not met. It happened because, during the COVID-19 pandemic, stock markets worldwide experienced volatility increases (PwC, 2020), which caused stock prices to change rapidly and unpredictably. Ultimately, the insignificant change in initial return post-COVID-19 pandemic makes underpricing remain constant and does not change.

This research also found a significant increase in trading volume post-COVID-19 pandemic. This outcome aligns with the result of Kubiczek and Tuskiewicz (2022), which revealed that the average percentage change between transactions increases during the pandemic. It occurs because the heavily discounted issue prices during the pandemic will attract more investors to buy the shares so that the trading volume will experience an increase. This result contradicts the result found by Apergis et al. (2023), which shows that the pandemic shocks negatively impact liquidity, and also the result found by Ilbasmis (2023), which failed to prove a significant change in the total traded volume in the initial day.

6 Conclusion

In this research, we explore the IPO performance post-COVID-19 pandemic, specifically in the Indonesia Stock Exchange, one of the top emerging stock markets in Asia and arguably one of the best performers in Southeast Asia, which, according to Nikkei Asia (2023), accounted for more than half of the total IPOs in Southeast Asia during the COVID-19 pandemic. The results show that the share offering rate and trading volume experienced a significant increase post-COVID-19 pandemic, while the issue price and issue size experienced a significant decrease instead. In addition, initial return and underpricing did not show any significant changes post-COVID-19 pandemic.

6.1 Research implications

Overall, this study analyzes how IPO performance improved post-COVID-19 pandemic, and our findings suggest that the IPO market in Indonesia was not necessarily positively impacted by the decreasing uncertainty after COVID-19 status as WHO declared over PHEIC on May 5, 2023. We found that while share offering rate, issue price, issue size, and trading volume react vibrantly post-pandemic, initial return and underpricing did not show any significant changes due to the increases in stock price volatility within the COVID-19 framework, which eliminated the *ceteris paribus* assumption and cause the adjusted close price not to remain constant.

Our findings suggest that companies improve the performance shown in prospectuses to reduce information asymmetry and future uncertainty. That may prevent initial shares from being priced cheaper and cause underpricing to be greater. Companies should also decrease the share offering rate to a significant degree to increase investor demand and trading volume to signal to investors that the IPO was not done to settle its financial difficulties but to anticipate a good prospect in the future. For investors, we recommend buying initial shares during the crisis because the price tends to be heavily discounted so that the initial return will be high. We expect investors to maximize the information available on the prospectuses and compare it to share offering rate, issue price, and issue size to gain an insight into whether the information available is delivering a good signal.

6.2 Limitations of research and suggestions

We do not analyze the long-run performance post-pandemic, so it becomes our research limitation. It occurs because, by the time this research is underway, the declaration was only made four months ago, so we lack post-pandemic samples. We only chose those recorded on the main board to avoid outliers and equalize the sample size between the pandemic and post-pandemic groups. We recommend that future studies analyze samples from every listing board in the Indonesia Stock Exchange as in other stock markets worldwide.

References

1. Anthony & Govindarajan: Management control system. Salemba Empat, Jakarta (2005).
2. Apergis, N., Lau, C.K., & Xu, B.: The impact of COVID-19 on stock market liquidity: Fresh evidence on listed Chinese firms. *International Review of Financial Analysis* 90 (2023). <https://doi.org/10.1016/j.irfa.2023.102847>
3. Baig, A.S. & Chen, M.: Did the COVID-19 pandemic positively impact the IPO Market? An analysis of information uncertainty. *Finance Research Letter* 46, 1-11 (2022).

- <https://doi.org/10.1016/j.frl.2021.102372>
4. Barro, R.J., Ursua, J.F., & Weng, J.: The corona virus and the great influenza pandemic: Lessons from the Spanish flu for the corona virus' potential effects on mortality and economic activity. NBER Working Papers, No. w26866 (2020). <https://ideas.repec.org/p/nbr/nberwo/26866.html>
 5. Beatty, R.P. & Ritter, J.R.: Investment banking, reputation, and the underpricing of initial public offering. *Journal of Financial Economics* 15, 213-232 (1986). [http://dx.doi.org/10.1016/0304-405X\(86\)90055-3](http://dx.doi.org/10.1016/0304-405X(86)90055-3)
 6. Dasgupta, S., Gan, J., Gao, N.: Transparency, price informativeness, and stock return synchronicity: Theory and evidence. *The Journal of Financial Quantitative Analysis* 45(5), 1189-1220 (2010). <https://www.jstor.org/stable/27919561>
 7. Gao, H., Darroch, J., Mather, D., & MacGregor, A.: Signaling corporate strategy in IPO communication: A study of biotechnology IPOs on the NASDAQ. *Journal of Business Communication* 45(1), 3-30 (2008). <https://doi.org/10.1177/0021943607309349>
 8. Hadiwidjaja, R.D., Muditomo, A., & Trisnowati, Y.: IPO under-pricing phenomenon approach: Does Covid-19 has a negative sectoral impact? *Journal of Accounting and Strategic Finance* 4(2), 207-221 (2021). <http://dx.doi.org/10.33005/jasf.v4i2.198>
 9. Herawati, A., Achسانی, N.A., Hartoyo, S., & Sembel, R.: IPO company stock valuation analysis 2000-2014. *International Journal of Organizational Innovation* 9(3), 72-83 (2017). <https://repository.ipmi.ac.id/10/>
 10. Ilbasmis, M.: Underpricing and aftermarket performance of IPOs during the COVID-19 period: Evidence from Istanbul Stock Exchange. *Borsa Istanbul Review* 23(3), 662-673 (2023). <https://doi.org/10.1016/j.bir.2023.01.004>
 11. Indonesia Stock Exchange: Aktivitas pencatatan, <https://www.idx.co.id/id/perusahaan-tercatat/aktivitas-pencatatan/>, last accessed 2023/08/25.
 12. Kelly, B., Ljungqvist, A.: Testing asymmetric-information asset pricing models. *The Review of Financial Studies* 25(5), 1366-1413 (2012). <https://doi.org/10.1093/rfs/hhr134>
 13. Kim, J.B., Krinsky, I., & Lee, J.: The Aftermarket performance of initial public offerings in Korea. *Pacific-Basin Finance Journal* 3, 429-448 (1995). <https://ideas.repec.org/a/eee/pacfin/v3y1995i4p429-448.html>
 14. Kubiczek, J. & Tuszkiewicz, M.: Intraday patterns of liquidity on the Warsaw Stock Exchange before and after the outbreak of the COVID-19 pandemic. *International Journal of Financial Studies* 10(13), 1-16 (2022). <https://doi.org/10.3390/ijfs10010013>
 15. Kuswanto, R.: IPO stock performance amidst the COVID-19 pandemic: Has it been undervalued? *Jurnal Dinamika Akuntansi dan Bisnis* 8(1), 105-116 (2021). <https://doi.org/10.24815/jdab.v8i1.19830>
 16. Leland, H.E. & Pyle, D.H.: Informational asymmetries, financial structure, and financial intermediation. *The Journal of Finance* 32(2), 371-387 (1977). <https://doi.org/10.2307/2326770>
 17. Leow, H.W. & Lau, W.Y.: The impact of global financial crisis on IPO underpricing in Malaysian stock market. *Review of Pacific Basin Financial Markets and Policies* 21(04), 1-17 (2018). <https://ideas.repec.org/a/wsi/rpbfmp/v21y2018i04ns0219091518500236.html>
 18. Li, R., Liu, W., Liu, Y., & Tsai, S.B.: IPO Underpricing after the 2008 financial crisis: A Study of the chinese stock markets. *Sustainability* 10(8), 2844 (2018). <https://doi.org/10.3390/su10082844>
 19. Ljungqvist, A., & Wilhelm, W. J.: IPO pricing in the dot-com bubble. *The Journal of Finance* 58(2), 723-752 (2003). <https://doi.org/10.1111/1540-6261.00543>
 20. Loberg, E. & Haugdal, T.D.: Initial public offerings at Nordic Multilateral Trading Facilities during Covid-19. Master Thesis. *Financial Economics Major, Norwegian School of Economics, Bergen* (2021). <https://openaccess.nhh.no/nhh-xmlui/handle/11250/2982809>
 21. Low, S.W. & Yong, O.: Explaining over-subscription in fixed-price IPOs: Evidence from the Malaysian stock market. *Emerging Markets Review* 12(3), 205-216 (2011). <https://ideas.repec.org/a/eee/ememar/v12y2011i3p205-216.html>
 22. Mazumder, S. & Saha, P.: COVID-19: Fear of pandemic and short-term IPO performance. *Finance Research Letters* 43, 1-10 (2021). <https://doi.org/10.1016%2Fj.frl.2021.101977>
 23. Mehmood, W., Mohd-Rashid, R., & Ahmad, A.H.: Impact of pricing mechanism on IPO oversubscription: Evidence from Pakistan stock exchange. *Pacific Accounting Review* 32(2), 239-254 (2020). <http://dx.doi.org/10.1108/PAR-04-2019-0051>
 24. Morris, R.D.: Signalling, agency theory and accounting policy choice. *Accounting and Business Research* 18(69), 47-56 (1987). <https://doi.org/10.1080/00014788.1987.9729347>
 25. PwC: IPO watch data, <https://www.pwc.com/gx/en/services/audit-assurance/ipocentre/ipo-journey/ipo-watch-data-explore-exchange.html>, last accessed 2022/06/07.
 26. Nikkei Asia: IPOs in Southeast Asia keep growing despite global headwinds, <https://asia.nikkei.com/Business/Markets/IPO/IPOs-in-Southeast-Asia-keep-growing-despite-global-headwinds>, last accessed 2023/08/25.
 27. Ningrum, I.S. & Widiastuti, H.: Analisis faktor-faktor yang mempengaruhi tingkat underpricing saham pada saat initial public offering: Studi empiris pada perusahaan yang melakukan penawaran umum perdana di Bursa Efek Indonesia periode 2012-2016. *Reviu Akuntansi dan Bisnis Indonesia* 1(2), 131-143 (2017). <https://doi.org/10.18196/rab.010212>
 28. Nurwulandari, A. & Melati: Effect of COVID-19 pandemics on ASEAN Stock Exchange. *International Journal of Innovation, Creativity and Change* 13(1), 1495-1504 (2020).

- https://ijicc.net/images/vol_13/141111_Nurwulandari_2020_E2_R.pdf
29. PwC: IPO watch data, <https://www.pwc.com/gx/en/services/audit-assurance/ipocentre/ipo-journey/ipo-watch-data-explore-exchange.html>, last accessed 2022/06/07.
 30. Rasyad, A.A., Fianto, B.A., & Busser, R.: Determinants of IPO oversubscription on islamic stocks: Evidence from Indonesia. *Journal of Islamic Monetary Economics and Finance* 8(3), 485-499 (2022). <https://doi.org/10.21098/jimf.v8i3.1566>
 31. Ramelli, S. & Wagner, A.F.: Feverish stock price reactions to COVID-19. Finance Institute Research Paper, 12-20 (2020). <https://dx.doi.org/10.2139/ssrn.3550274>
 32. Ritter, J. R.: The costs of going public. *Journal of Financial Economics* 19(2), 269–281 (1987). [https://doi.org/10.1016/0304-405X\(87\)90005-5](https://doi.org/10.1016/0304-405X(87)90005-5)
 33. Rock, K.: Why new issues are underpriced. *Journal of Financial Economics* 15(1-2), 187–212 (1986). [https://doi.org/10.1016/0304-405X\(86\)90054-1](https://doi.org/10.1016/0304-405X(86)90054-1)
 34. Surana, S.: Indian retail investors and initial public offers: Pre and post covid analysis. *Information Technology in Industry* 9(2), 345-352 (2021). <https://doi.org/10.17762/ITII.V9I2.353>
 35. Tajuddin, A.H., Mohd-Rashid, R., Abdullah, N.A.H., & Abdul-Rahim, R.: An empirical examination of over-subscription in the Malaysian IPO market. *International Journal of Economics and Management* 9(Special Issue), 81–102 (2015). https://www.researchgate.net/publication/288228147_An_empirical_examination_of_over-subscription_in_the_Malaysian_IPO_market
 36. The World Bank: GDP: Current US\$, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2020&start=2015>, last accessed 2023/08/25.
 37. Yahoo Finance, <https://finance.yahoo.com/>, last accessed 2023/08/29.
 38. Zhang, D., Hu, M., & Ji, Q.: Financial markets under the global pandemic of COVID-19. *Finance Research Letter* 36, 1-6 (2020). <https://doi.org/10.1016/j.fl.2020.101528>

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