

Long-Term Effect of IPO Underpricing on Aftermarket Liquidity

*Almanda Vallerie Karyono*¹, *Amelia Limijaya*^{1*}, and *Yanthi Hutagaol-Martowidjojo*¹

¹ Finance (International) Program, Accounting Department, School of Accounting, 11480 Bina Nusantara University Jakarta, Indonesia

Abstract. This research examines the long-term effect of IPO underpricing on the aftermarket liquidity for firms that decided to go public on the IDX between the period of 2016 to 2019. Additionally, this research also employs firm size, ownership structure, firm performance, and underwriter reputation as control variables. The sampling method used is a purposive sampling method and a total of 122 companies listed on the IDX's main and development boards are used as the research samples. The method of analysis used is the multiple regression analysis. The result suggests that IPO underpricing does have a positive effect on aftermarket liquidity when a simple regression is conducted. However, its significance on liquidity is taken over by firm size when multiple regression is performed. The result might suggest that IPO underpricing is no longer relevant in the aftermarket liquidity since there is more information revealed within 12 months after the IPO. Nevertheless, result should be interpreted cautiously due to relatively small sample size, which may warrant further studies.

1. Introduction

These past few years, the Indonesian capital market has shown impressive growth resulting in more companies being listed on the Indonesian Stock Exchange (IDX). Company growth requires an additional amount of capital which can either be made internally or externally. Internally, a company could use its retained earnings to fund its expansion, while externally, the company could gain additional capital through bank loans or by issuing shares through Initial Public Offering (IPO) in the capital market. IPO can be said to be a significant stage in a firm's evolution as it could change the structure of the firm. In going public, a firm may gain a lot of benefits both financially and non-financially.

At IPO, firms tend to underprice to attract investors in investing in a new company. IPO underpricing is a phenomenon where the offer price of the share is lower than the market price in the secondary market (Ljungqvist 2007). There is extant literature that investigates how IPO underpricing is affected by factors such as auditor's reputation, underwriter's reputation, and information asymmetry (Sapian et al. 2013; Hahn et al. 2013). In addition to that, many researchers have also studied the effect of IPO underpricing on aftermarket price liquidity, however the results are mixed (e.g., Aydin and Asli 2006; Khodavandloo and Zakaria 2016, Sapian et al. 2013). Market liquidity can be defined as the degree of ease with which investors can sell or buy shares of a firm on a timely basis. The faster the trading process, the more liquid is the company and vice versa. Liquidity is not only important for deciding the price of an asset, but

it can also act as an indicator of the quality or health of a firm in the financial market (Afriyani 2019). Liquidity can basically be measured in different ways, for example based on the degree of match between the buyers and seller at a given point at a time, depending on the number of shareholders (Zhong and Takehara 2020).

This research is motivated by the lack of prior literature that examines the relationship between underpriced IPO and secondary market liquidity in the long run, particularly in emerging markets. Prior research focuses on examining the relationship between these two variables under a relatively short observation period. Nevertheless, long-term liquidity in the secondary market is of equal importance as short-term one, as it decreases the risk premium which therefore will lead to an increase in the company's value of traded financial assets (Ivanhoff 2010). Arseneau et al. (2015) also state that liquidity in the secondary market is an important consideration for investors when it comes to buying long-term assets. Therefore, it is argued that keeping a secondary market liquid is important for both the short and long run as it is the base for all investors' decision-making to buy and hold long-term assets. Moreover, a liquid market in the long-term facilitates more profitable investments, which in turn improves the capital allocation and supports economic growth in the long run (Abdul-Khaliq 2013). In addition, as previous studies find that there is a tendency of momentum strategy applied by investors in Indonesia (Koesrindartoto et al. 2020; Syamni et al. 2020; Syamni

* Corresponding Author: amelia.limijaya@binus.edu

et al. 2021), it is essential to examine if this momentum holds over a longer-term horizon.

Furthermore, a liquid secondary market helps in reducing the cost for investors by ensuring low transaction cost as well as lower volatility (IOSCO 2007). Rouwenhorst (2002) states that liquidity is one of the factors considered by investors when investing in emerging markets. With Indonesia being an emerging country, which tends to be more illiquid, it is important to pay attention to the liquidity risk. As investors are attracted to liquid markets, therefore, liquidity is a crucial factor for the growth and development of the market. In addition to that, market liquidity is also important to the stability of the financial system in a country as it helps in the absorption of systemic shocks as such it could reduce the price volatility that is brought about by sudden changes in investors' risk appetite. This in turn will help in limiting the potential adverse side effects on the rest of financial system as well as the broad economy (IOSCO 2007).

1.1 Objectives

This study aims to analyze the association between underpriced IPO and secondary market's liquidity of listed companies in Indonesia over a longer-term period. It is expected that this study could shed a light or bring a new perspective to the IPO underpricing phenomenon, particularly in the context of Indonesia. The main question addressed in this study is whether the relationship between underpricing of IPO and the liquidity of the secondary market is true for the long term.

2. Literature Review

Past studies suggest that IPO underpricing appears to be one of the factors that could influence the liquidity in the secondary market. Booth and Chua (1996) claim that issuing firms underpriced their IPOs with the intention of creating a dispersion of ownership by promoting oversubscription which will then help the issuing company to have a liquid aftermarket for the company's shares. In line with this, Pham et al. (2003) also argue that underpricing is an essential aspect that draws investors into the market, making the ownership more disperse, which then improves the liquidity. Similar results that find a positive relationship between IPO underpricing and aftermarket liquidity have also been reported by other studies, such as Ellul and Pagano (2006) and Sopian et al. (2013). As mentioned in the previous section, most studies examine the short-term relationship between IPO underpricing and aftermarket liquidity, despite the importance of longer-term observation. Nevertheless, a prior study conducted in a developed market finds that IPO underpricing does increase aftermarket liquidity over the first year of trading (Hahn et al. 2013).

Findings from Ljungqvist (2007) and Charoenwong et al. (2016) show that when newly listed companies offer underpriced shares at IPO, they tend to have their share price increase substantially on the first day of

trading, resulting in a liquid aftermarket. Underpricing of shares at IPO is characterized by a positive return for investors who decided to sell their shares on the first day. The positive initial return can be measured through the difference between the price in the secondary market and the price of shares during IPO (Lowry et al. 2010). With underpriced IPO offering a positive initial return, it is expected that this will attract investors into investing in the company, therefore, increasing the shares' liquidity. In other words, this positive initial return will create a momentum for investors to keep trading these IPO shares, hence increases the liquidity in the long run. This premise is supported by prior research (Nnadi and Tanna 2019) that observes the presence of momentum effect with varying degrees in emerging markets, where India shows the strongest momentum effect, Russia is the weakest, and China, Brazil and South Africa in between. Specifically in Indonesian context, previous studies find that there is a tendency of momentum strategy applied by investors in Indonesia. For example, Koesrindartoto et al. (2020) conclude that institutional investors, as the dominant player in the market, tend to perform momentum strategies. Meanwhile, it was also found that both domestic and foreign investors who trade in small sizes tend to exhibit momentum strategy (Syamni et al. 2020; 2021). Therefore, based on this argument, this research extends past studies by exploring the long-term relationship between underpriced IPO and aftermarket liquidity in the context of a developing country and proposes the following hypothesis:

H1: IPO underpricing increases aftermarket liquidity in the long run.

In addition to the level of IPO underpricing, aftermarket liquidity is also affected by several other factors. In this study, we include them as part of our control variables. Sopian et al. (2013) posit that aftermarket trading (liquidity) is influenced by the investor base in which a broader investor base tends to generate a higher level of liquidity. Some IPO firms have desires to have a block ownership structure in order to provide a monitory power to the large shareholders and some may want to have a dispersed ownership structure in order to obtain a liquid aftermarket and this is often considered as one of the important criteria for a successful IPO process. Indeed, past researchers have pointed out that firms with a more diffuse ownership structure have a more liquid aftermarket which offers various kinds of advantages. As firms have a more dispersed ownership structure, more shares are held by the public, thus the chances of one investor meeting another investor to enter into an economic transaction are higher, therefore resulting in a higher trading volume, indicating a higher liquidity aftermarket. Heflin and Shaw's (2000) findings **show** that higher block ownership results in a decrease of firm's liquidity. This result is consistent with the study by Brockman et al. (2009), who observe that block ownership reduces the shares' trading activity. Booth and Chua (1996) hypothesize that firms whose intention is to seek a liquid aftermarket will tend to underprice at IPO to attract a greater number of small shareholders in order to create

a dispersed ownership structure. Based on the above explanation, our first control variable is the firm's ownership structure.

Next, the size of a firm is one of the factors that could also affect liquidity. Kavajecz (1999), Lakonishok and Lee (2001) and Li et al. (2005) find that the greater the firm size, the higher is the shares' liquidity. We also observe a similar result (not displayed here) in the context of Indonesia, in which firms are placed into three different boards on the IDX (main, developing, and acceleration) depending on their sizes. We took a sample of firms which went within during the observation period and find that those listed on the main board (which indicates larger firm size) has the highest liquidity compared to the remaining two boards. Therefore, our second control variable is firm size. Following firm size as the control variable is firm profitability. When a company has good profitability, a lot of investors tend to be drawn to the company, therefore increasing the demand for the company's shares. High demand for IPO could result in a higher degree of underpricing (Rummer et al. 2004). In addition, it could also result in the increase of offering price in the secondary market (Purbarangga and Yuyetta 2013). Furthermore, according to Chu and Ip (2007), higher profitability results in an increase in the number of short selling. This will therefore increase the number of trading volumes in the aftermarket, resulting in high aftermarket liquidity.

Our final control variable is the underwriter's reputation. An underwriter is a party whose task is to advise the issuing firms during the process of IPO. Underwriters will keep on supporting the firms in providing pieces of information that are relevant to investor's needs which therefore helps in reducing the information asymmetry as well as improving the firm's quality to catch the attention of potential investors (Widarjo et al. 2017). Potential primary market investors' view underwriters with a good reputation to have set the share prices of the issuing firm at a fair price (Yuliani et al. 2019). Therefore, it is viewed that the more reputable the underwriter is, the degree of IPO underpricing is lower, thus the IPO shares tend to not experience any significant price increase in the secondary market, resulting in investors obtaining a low initial return. Therefore, it is regarded that the underwriter's reputation has an inverse relationship with aftermarket liquidity.

3. Methods

In alignment with the objective of the current study, a purposive sampling method is used. A set of criteria is used to evaluate whether the firms are eligible to be part of the sample, which consist of being listed in IDX during the observed time (2016-2019), having complete information that is accessible, and experiencing underpriced IPO. In addition to that, firms listed on the acceleration board will be excluded as the market is still considered new. The initial sample is made up of 162 firms that went public from 2016 to 2019. After applying the sample inclusion criteria as explained

previously, 40 firms are excluded, leaving 122 firms as the final sample.

The dependent variable in this study is aftermarket liquidity (AFL), which is measured using a spread measurement taken from Abdi and Ranaldo (2017) as stated in equation (1) below:

$$S = 2\sqrt{E(C_t - \eta t)(C_t - \eta t + 1)} \quad (1)$$

Where:

S = Effective spread

C_t = Observable close log-price

ηt = Mid-range (average daily high and low log-prices)

Bid-ask spread is one of the most popular measures to represent liquidity. However, the quoted data for these measures may not be readily available, as in our case. Therefore, a new method to estimate this spread is proposed by Abdi and Ranaldo (2017) by using close, high, and low prices, which are publicly available. They argue that this method is an appropriate proxy for spread and it delivers the most accurate estimates of stocks that are less liquid.

This AFL will be measured on different time intervals: three points for short-term observation (30th, 60th, and 90th day post-IPO) and four points for long-term observation (4th, 6th, 9th, and 12th month post-IPO). IPO underpricing degree (UNDP) is the independent variable, which is measured as follows (Espinasse 2014):

$$\frac{\text{Closing Price} - \text{Offering Price}}{\text{Offering Price}} \quad (2)$$

As explained previously, this study employs several control variables. Firm size (SIZE) is measured by the log market capitalization of the firm, while the ownership structure (OS) is proxied by the percentage of shares held by blockholders (defined as shareholders who have more than 5% share ownership). Firm performance (PERF) is measured by ROA as an indicator of profitability, calculated by dividing firm's net income with its total assets. Lastly, the measurement for underwriter's reputation (UNDR) adopts the model developed by Angelia and Basana (2019) based on Carter and Dark's (1993) model in ranking the underwriter's reputation. Three indicators of the most active IDX members are used to measure this variable, which include trading frequency, trading value, and trading volume that are available in the yearly factbook of IDX. Scores are assigned based on the rank of the most active IDX members, for example the first rank gets a score of 10 and the tenth rank gets a score of 1, while 11th to 15th rank gets a score of 0.5 and 16th to 20th gets a score of 0.25. Lastly, below 20th rank is assigned a score of 0.125. With underwriters that are not included in the list of IDX's most active members in the year that the firm goes through the process of IPO, the rank of the firm's underwriter will be assumed to have a rank of above 50. This study uses multiple regression analysis based on the following research model:

$$AFL = \alpha + \beta_1 UNDP_i + \beta_2 SIZE_i + \beta_3 OS_i + \beta_4 PERF_i + \beta_5 UNDR_i + \mathcal{E} \quad (3)$$

4. Data Collection

Data is collected through secondary data sources, mainly from the IDX website and Yahoo Finance.

5. Results and Discussion

5.1 Numerical Results

Table 1 displays the descriptive statistics of the 122 sample firms. Initially, the AFL increases from 5.4892 to 5.5170 from the 30th to 60th day. However, it then constantly decreases up to 5.4446 in the 12th month observation period. As AFL is measured using spread, lower values indicate more liquid market as the time passes. Thus, our observation shows that the market gets

more liquid (with the exception of the 60th day). Meanwhile, the mean of UNDP indicates that on average, the sample companies are underpriced by 81.79%, though it ranges from 0.56% to 253.04%. The result of correlation analysis (not tabulated) shows a negative significant correlation between UNDP and AFL both in short- and long-term period, despite decreased significance in long-term observation points. This negative correlation means that higher UNDP results in lower spread, thus more liquid aftermarket, in accordance with what we hypothesized. Meanwhile, SIZE has a positive significant correlation with AFL in all observation periods, which indicate larger firms tend to be less liquid, in contrast to our prediction. Other control variables (OS, PERF, UNDR) do not appear to have significant correlation with AFL.

Table 1. Descriptive Statistics Result

Variables	No. of Observation	Mean	Median	St. Dev.	Minimum	Maximum
AFL (30 th day)	122	5.4892	5.5448	0.9615	1.6358	7.3462
AFL (60 th day)	122	5.5170	5.5554	1.0154	1.6350	7.3746
AFL (90 th day)	122	5.5100	5.5681	1.0547	1.6322	7.4288
AFL (4 th month)	122	5.4896	5.5552	1.1127	1.1706	7.4422
AFL (6 th month)	122	5.4895	5.5415	1.1206	1.6473	7.5296
AFL (9 th month)	122	5.4691	5.5732	1.1625	1.6541	7.7243
AFL (12 th month)	122	5.4446	5.5261	1.1807	1.6592	7.7660
UNDP	122	0.8179	0.8682	0.4804	0.0056	2.5304
SIZE	122	25.5195	25.3664	1.2364	23.5082	29.2733
OS	122	0.7714	0.7785	0.1231	0.4019	0.9972
PERF	122	0.0319	0.0221	0.1043	-0.3910	0.6127
UNDR	122	0.9064	0.1250	1.8247	0.1250	9.3333

Next, a multiple regression analysis is conducted to examine the research hypothesis. Prior to that, we find some outliers in the data. To treat these outliers, first, the residuals are studentized. The studentized residual that exceeds plus and minus 2 are then listed. This way, the potential outliers are identified and removed. The remaining data are then regressed. With this method, different observation periods result in different observation numbers. Tables 2 and 3 show the regression result for short-term (30th, 60th, and 90th day) and long-term observation points (4th, 6th, 9th, and 12th month), respectively. Regression is done in two steps, first by including only the independent variable, and secondly by adding the control variables.

In the first step of the regression, we observe a negative significant effect of UNDP on AFL on the 30th and 60th day, as well as on the 9th and 12th month after the IPO. Meanwhile, on the 90th day, 4th and 6th month, the coefficient of UNDP is negative but not significant. This could be caused by the insignificant model which suggests that the model is not applicable to the analysis. The regression results confirm the negative relationship between UNDP and AFL measured using spread as observed in the correlation analysis, which means higher UNDP causes more liquid aftermarket. The result of the

UNDP coefficient sign is in line with the hypothesis that when UNDP increases, it is expected that companies will have more liquidity, as indicated by the lower spread. Similar results are found in prior studies (Ellul and Pagano 2006; Sapian et al. 2013; Khodavandloo and Zakaria 2016). Nevertheless, UNDP is only significant at certain observation points when the analysis does not include control variables. When control variables are added into the analysis (second step of the regression), the significance of UNDP is taken over by SIZE. As apparent from the above two tables, SIZE is positively significant on AFL across all observation periods. In the meantime, other control variables have insignificant positive coefficients on AFL.

The insignificance of UNDP on AFL was also found by Ramli and Suherman (2010), where they argue that it might be caused by the different characters that Indonesian market possesses compared to other countries, such as the US. With a large percentage of US investors being flippers, in which they purchase shares at IPO and immediately sell the shares again in the secondary market, it is necessary for them to have a risk premium for the illiquid aftermarket. Whereas in Indonesia, it appears that most of the investors purchase shares with the purpose of holding them for the longer

term. Therefore, they do not require to have an aftermarket illiquidity risk premium as much. Thus, it appears that UNDP might not be regarded as a factor that affects aftermarket. Further, the result could also indicate that investors do not focus on investing in underpriced shares and IPO underpricing is no longer relevant in aftermarket liquidity since there is more information revealed within 12 months after the IPO.

The positive significant coefficient of SIZE on AFL suggests an inverse relationship, as firms are larger, their shares become less liquid (more spread). This is similar to Khodavandloo and Zakaria (2016), but in contradiction to several prior studies which conclude a positive effect of firm size on IPO stock liquidity (Kavajecz 1999; Lakonishok and Lee 2001; Li et al. 2005). A potential explanation for our finding is that investors tend to be attracted to investing in smaller firms. There is a view that when they only have limited funds, Indonesian young traders tend to prefer small capitalization stocks that can move more aggressively (Yanwardhana 2021). These stocks are more likely undervalued and have more room to grow in the future, as opposed to big, mature firms. In addition, the ownership structure held by bigger size companies might also be the cause. The positive correlation between SIZE and OS might suggest that as companies get bigger, their ownership structure becomes less dispersed. With a more block ownership structure, there could be less trading activities, resulting in wider spread (less liquidity). A study by Jacoby and Zheng (2010) also observes block ownership to be positively related to the spread. The result of our analysis is similar to the ownership dispersion hypothesis (Booth and Chua 1996), in which when companies seek a liquid aftermarket, it will underprice to attract the small shareholders, thus creating dispersed ownership. As our

result shows a negative coefficient of UNDP to AFL (although only significant in the first regression), to some extent it indicates that the sample firms do underprice to get a liquid aftermarket in return.

Meanwhile, other control variables show insignificant effect on AFL, despite the direction of coefficients as expected (except for PERF). The insignificance might be caused by the relatively small sample size. As shown in the descriptive statistics table, most companies are underwritten by the low-tier underwriters. A similar trend was found also in a prior study conducted in Indonesia (Salfida et al. 2014), which causes UNDR to be insignificant towards UNDP, and consequently on AFL.

In sum, despite some limitations in the model, it is expected that this study could bring a new perspective in the area. A liquid stock market is important and advantageous to investors and could benefit the whole country's economy; it allows investors to be able to enter into transactions at a competitive price and at any time. Companies that underprice their share price at IPO are likely to be able to survive in the secondary market, as even though they get less capital at first, with high aftermarket's liquidity it is easier for them to find more investors to raise more capital in the next offering. However, looking at the result of the current research, investors should be aware that due to different market characteristics in different countries, factors affecting aftermarket liquidity might vary between different countries. Specifically in Indonesia, investors who would like to invest in IPO companies should consider looking at the size of the company, since this result has shown that SIZE does provide a significant effect on aftermarket liquidity, while the effect of UNDP is somewhat inconclusive.

Table 2. Regression Analysis Result (short-term observation)

Variable	AFL 30 (1)	AFL 30 (2)	AFL 60 (3)	AFL60 (4)	AFL 90 (5)	AFL 90 (6)
Constant	5.8408*** (41.94)	0.2197 (0.13)	5.8405*** (38.80)	0.1954 (0.11)	5.8361*** (36.72)	0.3499 (0.18)
UNDP	-0.3070** (-2.08)	0.0306 (-0.19)	-0.2694* (-1.68)	-0.0008 (-0.00)	-0.2719 (-1.61)	-0.0156 (-0.08)
SIZE	-	0.1989*** (3.24)	-	0.2015*** (2.99)	-	0.1972*** (2.75)
OS	-	0.3109 (0.55)	-	0.2879 (0.46)	-	0.2459 (0.37)
PERF	-	0.9383 (1.45)	-	0.7354 (1.03)	-	0.7602 (1.00)
UNDR	-	0.0479 (1.26)	-	0.0358 (0.85)	-	0.0285 (0.64)
F-Stat	4.31***	3.99***	2.84**	2.90**	2.59**	2.44**
Adjusted R ²	0.0275	0.1134	0.0155	0.0749	0.0134	0.0581
No. of observation	118	118	118	118	118	118

Table 3. Regression Analysis Result (long-term observation)

Variables	AFL 4 (1)	AFL 4 (2)	AFL 6 (3)	AFL 6 (4)	AFL 9 (5)	AFL 9 (6)	AFL 12 (7)	AFL 12 (8)
Constant	5.8123*** (35.25)	-0.1016 (-0.05)	5.8117*** (33.78)	-0.2482 (-0.12)	5.8076*** (31.56)	-0.6179 (-0.28)	5.8044*** (31.10)	-0.5665 (-0.25)
UNDP	-0.2562 (-1.46)	0.0157 (0.08)	-0.2886 (-1.57)	-0.0153 (-0.08)	-0.3356* (-1.71)	-0.0437 (-0.20)	-0.3492* (-1.75)	-0.0372 (-0.17)
SIZE	-	0.2075*** (2.80)	-	0.2085*** (2.69)	-	0.2135** (2.58)	-	0.2023** (2.58)
OS	-	0.4505 (0.66)	-	0.6189 (0.87)	-	0.9101 (1.20)	-	1.1614 (1.52)
PERF	-	0.7739 (0.99)	-	0.705 (0.85)	-	0.8495 (0.97)	-	2.0574** (2.01)
UNDR	-	0.0212 (0.46)	-	0.0128 (0.27)	-	0.0073 (0.14)	-	0.0000 (0.00)
F-Stat	2.14*	2.44**	2.48**	2.38**	2.94**	2.57**	3.07**	3.29***
Adjusted R ²	0.0265	0.0579	0.0126	0.0560	0.0163	0.0628	0.0175	0.0900
No. of observation	118	118	117	117	118	118	117	117

5.2 Validation

As a robustness check (not tabulated), an alternative measurement of AFL is employed by using average daily trading volume (Sapian et al. 2013). A similar result with the main analysis is observed regarding UNDP, in which it has a positive effect on AFL, despite not significant. SIZE has a positive impact on AFL, indicating larger firms tend to be more liquid, which is the opposite of the main analysis. Other control variables show some similarities and differences compared to the main analysis. Nevertheless, it is worth noting that the robustness test research model is only applicable for several observation points in short-term period. In addition, we conduct additional analysis by separating the sample into two categories (high and low liquidity based on the median), to see if the results of both main and robustness analysis are driven by either category, and to offer more insights on the results. Separate regression is performed on each category for each observation period. The analysis shows an early indication that the result is driven by the low spread category. However, due to insignificant result that is probably caused by small sample size, especially since the sample is now divided, this indication might not be conclusive yet and further research may be warranted to confirm these findings.

6. Conclusion

This research examines the impact of IPO underpricing on aftermarket liquidity Indonesia over a longer-term observation. This study contributes to the existing literature by examining the IPO underpricing-aftermarket liquidity relationship in emerging markets over a longer observation period. Overall, the analysis shows that underpricing has a direct positive impact on

aftermarket liquidity, however its significance is taken over by firm size when control variables are included in the analysis. This might suggest that in Indonesia, IPO underpricing is not regarded as an important factor that affects aftermarket liquidity. However, the relatively small sample size, which is one of the limitations of the current study, might account for this insignificance. Thus, it is recommended that future studies can increase the sample size. Nonetheless, as stock liquidity is important for investors, it is expected that the result of the current study can benefit them by pointing out factors that could affect aftermarket liquidity, and that these factors might vary depending on the market's characteristics.

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