STOCK SPLIT AND ITS IMPACT UNDER BEARISH CONDITION: AN EMPIRICAL STUDY ON THE INDONESIAN STOCK MARKET

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งานวิจัยนี้ ศึกษาผลกระทบจากการแตกหุ้น (Stock split) ในสภาวะที่ตลาดหุ้นซบเซาหรือระหว่างวิกฤตทางเศรษฐกิจ การแตกหุ้น มักทำให้เกิดปัญหาสภาพคล่องและผลประกอบการ งานวิจัยนี้พิสูจน์ให้เห็นว่าการแตกหุ้นก่อให้เกิดผลดีต่อกิจการ ทฤษฎีหลักที่ใช้ในงานวิจัยนี้คือ ทฤษฎีการส่งสัญญาณตลาด และ ช่วงราคาซื้อขายหลักทรัพย์ ข้อมูลที่ใช้ศึกษาได้มาจาก ตลาดหุ้นอินโดนีเซียระหว่างปี 1997 - 1999

Abstract

This paper presents the impact of stock split in bearish condition or when the economy was hit by the crisis. When stock split is taken, the liquidity and abnormal return are the vital subjects to be explored further since the conclusion of those matters are still under discussion. This study proves that stock split can be valuable. The signaling theory and trading range theory are the principal theories to be addressed. This study was taken from Indonesian Stock Exchange in mid-1997 up to 1999.

INTRODUCTION

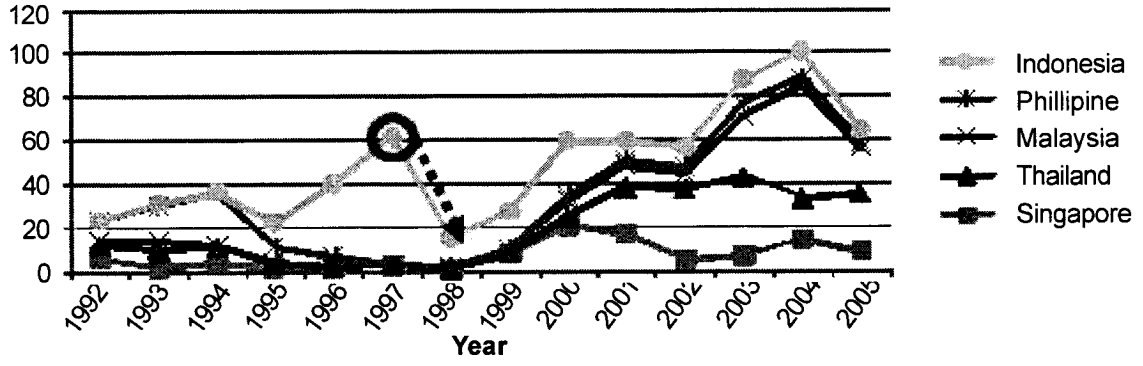
Generally stock split is issued in order to improve the level of liquidity because companies have seen their stock prices to the levels that are too high or out of the price level of similar companies in their sector (Fama, Fisher, Jensen & Roll, 1969; Lamoureux & Poon, 1987; Conroy, Harris, & Benet, 1990.) Illiquidity is the problem when the stock price starts to move up and becomes "expensive" for the investors. Most researchers state that the stock split is one indicator of bullish situation (Ader & Diamant, 2006; Nugraha, 2004); however, it does not mean that the stock split cannot be done in bearish markets. The only difference is on the likelihood of successful increased liquidity. This means the possibility of increased liquidity in the bull market is better than in the bear market (Nugraha, 2004).

Liquidity was a significant factor during the financial crisis in Indonesia in 1997. It all started when it was found that many Indonesian investors owed a large amount of dollars. Indonesia did not have a sound banking system which worsened the previous condition and to top it off, citizens lacked confidence in their government system. Such predicaments caused the country to experience the rampant contagious effects of the financial crisis. The Rupiah was down more than 200% because of a great demand for the U.S dollar. Liquidity became the big problem faced by many institutions and investors at that time.

Figure 1 shows that during mid-1997 to 1999, the stock split events in Indonesian stock exchange was peculiar as compared to neighboring countries (Philippines, Malaysia, Thailand and Singapore). The tendency to decline was obvious and sharp. This condition most likely happened because of the previous extreme increase that occurred before 1997. The economic growth in 1995 until mid-1997 created very sharp increases and when Indonesia was hit by the crisis, a super decline could not be avoided.

The study done by Grinblatt, Masulis & Titman (1984) has shown that the stock split is an important economic event and has generated anomalous return that does not happen only on the date of the announcement, but also on the ex-date. They found

Figure 1: Stock Split Events in Five (5) countries in ASIA



Source: Developed from Bloomberg database

abnormal returns 3 days after the stock split announcement. Based on a long period of observation, Fama et al. (1969) found the stock has given 30% abnormal return two years after the stock split. Sears & Trennepohl (1993) concluded the existence of market anomalies, because of the split, in that the company earnings will be greater. Dennis & Strickland (2003) stated that the positive abnormal return of stock split can be interpreted as a signal that corporate managers are optimistic about future prospects.

This paper aims to explore the impact of stock split during the bearish period and whether the liquidity can be improved (Muscarella & Vetsuypens, 1996; Baker & Gallagher, 1980) or should not occur (Lamoureux & Poon,1987; Conroy, Harris & Benet,1990 and Gray, Smith, & Whaley, 2003).

The evaluation of liquidity changes in this paper will be done between the pre-announcement period and various event windows surrounding the split announcement and the effective dates, which are the announcement, the post-announcement to pre-ex, the ex-date, and the post-ex periods. Using the liquidity proxies such as, Relative Spread, Zero, Volume, and Amihud, this paper is intended to explore whether:

1. there is any impact of stock split on liquidity during bearish period from mid-1997 to1999
2. the cumulative abnormal return can be explained by the change of liquidity.

Stock Split

Brigham & Ehrhardt (2005) explained that with the stock split, the shareholders are given a number (or fraction) of additional shares in accordance with a specified split factor. For example, in the three-for-one split (3:1), each shareholder will receive three new shares for each old share, so the amount of their ownership is augmented to three times the number of shares they held previously. Shortly, stock split action replaces the old number of shares with the bigger number of shares. As Libby, Libby & Short (2001: 609) stated

> *"In a stock split, the total number of authorized shares is increased by a specified amount, such as 2 for 1 split. In this instance, each held is called in, and two new shares are issued in its place."*

Stock split indicates the change in the number of shares outstanding along with the price level. Horngren, Harrison & Smith (2002:545) explained the impact of stock split as follows:

> *"Effect of stock split is a change in the par value of the stock. It also increases the number of shares of stock authorized, the issued and outstanding ones."*

Dolley (1993) studied the main reason of the stock split of the 88 sample companies that issued stock splits during the period of 1922 to 1930. After a survey was conducted on managerial action, it was found that liquidity was the main purpose with the expectation of a wider distribution of ownership shares. Baker & Gallagher (1980) interviewed 100 chief financial officers (CFO) of the NYSE listed companies in 1978. The study reported that most

companies do stock split in order to get a better trading range, and this condition can attract investors and increase liquidity in the stock trading. Both surveys provide similar results from different periods. Muscarella & Vetsuypens (1996) reported that stock splits can augment liquidity by increasing the number of ownership and thereby reducing the cost of stock trading. Maloney & Mulherin (1992) stated that trading volume increased due to stock split. Kadapakkam, Krishnamurthy & Tse (2005) found that the increase in the 'relative spreads' provided incentives for the brokers to promote the stock split to investors who have small budgets. Conroy et al. (1990); Gray et al. (2003) show the stock split triggers the spread to increase after the effective date. Though previous studies have supported the liquidity reason for the stock split, many researchers found conflicting results. Baker & Powell (1993) found that stock split had no impact on cash flow and stock ownership. Copeland (1979); Murray (1985); and Lamoureux & Poon (1987) reported that liquidity levels declined even after the stock split. Gray et al. (2003) argued that stock split increases trading costs because of the increasing number of market participants who want to make a profit. Lakonishok & Lev (1987), and Goyenko, Holden & Ukhov (2008) found that liquidity is a temporary condition and the increase in liquidity potentially occurs after 2 years.

There are many purposes of stock split but one of the main reasons is to facilitate solutions to making the trading transaction easier. For a growing company, publishing stock split will help them sustain progress. In addition, the reason of the issuance of stock split can be explained by psychology. This fact supported the idea of Fama et al. (1969) who indicated the unusual behavior of investors around the time of publication of stock split with the stock split allegedly given an unusual return too.

Stock split is based on two basic theories namely; Signaling Theory and the Trading Range Theory. Signaling theory was established by Brennan & Copeland (1989). Signaling theory states that managers have private information about the good prospects for the future of their companies. Signaling Theory, if applicable, conveys positive information about the company's future prospects after the issuance of stock split and its content, as a result that the predicted stock split announcement will indicate a positive market reaction and increased liquidity. Trading Range Theory suggests that the management decided to split because the behavior of stock markets where they believe will lower the prices which make trading more affordable. However, if the Trading Range Theory applies, the positive market reaction and increased liquidity will not be achieved until the date of execution of new shares to replace the old stock (Huang, Kartono & Ming-Shiun, 2007). Therefore, different time periods showed different implications under these two hypotheses.

The controversies including whether stock split affects the level of shareholders' wealth, changes the stock risk, increases liquidity, and provides signals to the market are still continuing. The differences may be due to diversities in samples, duration of observation, the state, or the investors.

Abnormal Return and Stock Split

Abnormal return is the difference between the expected return and actual return. Typically, the value of expected return obtained from the average index on capital markets. Abnormal return is sometimes triggered by "events". For example, mergers, dividend announcements, company earnings announcements, interest rate increases, lawsuits, stock split and so forth.

Abnormal return can be either good or bad, because it is only a summary of how the value of the difference between actual return and expected return. For example, 30% of income in mutual funds that are expected to average 10% per year will create a positive abnormal return of 20%. If, on the other hand, the actual return is 6%, this will result in negative abnormal returns of 4%.

Having seen the previous explanation, the abnormal return typically occurs when an interesting moment occurred in the market, such as stock split. Fama et al. (1969), Grinblatt et al. (1984), Lakonishok & Lev (1987), Asquith, Healey & Palepu (1989), Mc Nichols & Dravid (1990), and Desai & Jain (1997) reported the findings that appear abnormal for positive returns around stock split announcement date. Increased liquidity and risk causes an increase of abnormal returns and ultimate profitability.

The Exploration Methods

To prove whether the liquidity can be improved because of stock split in poor condition, and whether the liquidity proxies can explain the abnormal return, this research paper divides the timeline of investigation into some windows namely:- Pre-Announcement (A-252 to A-3), Announcement date (A-2 to A+2), Announcement to Ex-date (A+3 to E-1), Ex-date (E = 0 to E+4), Short-term Post Ex-date (E+5 up to E+10) and Post-Ex date period (E+11 to E+260). The length of 'pre-event' describes the condition before the stock split. There are two important events marked on the time frame, the Announcement period and Ex-date (exercise date). Announcement and Ex-date is marked 0, which marks the peak of research in this study, or events where a significant market event occurs. Pre-event started a few days before the actual event day. This procedure allows investigation into the leak of pre-event information. Post-event window is usually used to check the performance of the company after the incident in a long period of time. Thus, the classification of the data will be conducted in accordance with the time line that has been set.

1. *Comparing Method.*
   The first method is to analyze the liquidity proxies in the companies that made stock split. This is done by comparing the value of the liquidity proxies between windows.
2. *Regression Method*
   In accordance with the previous explanation, this method is used to examine the effects of liquidity variables on abnormal return. Implementation of this method is only dedicated to the Announcement and Ex-date.

The data in this paper mainly are from the Bloomberg database, the rest is taken from the website of Bank Indonesia and Bapepam (Capital Market Supervisory Agency). However, there are some conditions that have been set for the sample in this study. The requirements are:

The sampling procedures for Companies that issued stock split:

1. Companies that have been listed on the Jakarta Stock Exchange.
2. Companies that announce its stock split has been registered in JCI more than 1 year.
3. Sample was detected to stock split issue in mid-year period 1997 to 1999.
4. Stock price data, trading volume, bid and ask price must be available in the database at least a year before and after doing stock split and issuance.
5. In the entire period of the estimated 252 days before the 'announcement-date' and 260 after the 'ex-date' is expected that no data is lost. Tolerance for missing data is approximately 20%.

In order to verify the impact of stock split on liquidity, this research paper uses some proxies of liquidity that will be explored using Paired test. Firstly, Transaction Cost detection such as Relative Spread (RS) and [2]Zeros. [1]Relative Spread helps measure the proportional level of liquidity. The zeros is the formula developed by Lesmond, Ogden & Trzeinka (1999) that attempted to examine the transaction costs through the incidence of zero returns. Secondly, the ability to absorb higher transaction value is directly related to the proportion of the volume of transactions. The significant increasing volume is one of the major signals that the liquidity improvement has occurred (Wang & Rhee, 2009); (Muscarella & Vetsuypens, 1996); (Schultz, 2000). The last is Price Impact that could be traced by using [3]Amihud (Goyenko et.al, 2008). Amihud illiquidity ratio indicates how stock prices react due to daily trading volume in the rupiah. The increased volume in trading should bring in the result in a form of little change in prices. Thus, a more liquid market will show the value of smaller Illiquidity.

The second step of this study is to find the influence of liquidity variables on cumulative abnormal return in Announcement and Ex-date period by using Regression. The independent variables are changes in liquidity (ΔILLIQ), stock price (PRICE) and return variance (VAR) and the dependent variable is Cumulative Abnormal Return (CAR). ΔILLIQ is a change in the ratio between the Amihud Illiquidity and one of the main periods of two post announcement periods (i.e., the announcement and

Table 1: Split Factors Based on Year

Year	Total	2:1	4:1	5:1	10:1
		Low Split		Medium Split	High Split
July-Dec 1997	14	14			
1998	4	4			
1999	5	3		2	

Source: Developed from Bloomberg Database

ex-date periods), where a negative change indicates a change in liquidity. Improvement in liquidity after the announcement date should give a better outlook on operational performance. In this case, estimates of liquidity changes should give a negative coefficient on ΔILLIQ. Share price (PRICE) is within five trading days around Announcement and Ex-date. If the primary motive of stock split action is to reduce the share price to the lower range, then we should expect that PRICE has negative coefficient. The market should react more positively to lower prices after the split than before the split. ΔVAR is a change in return variance between pre-split period and post-split period. If we predict that there is an improvement in liquidity, consequently, it will bring an impact of an increase in risk then this variable should have a positive sign of coefficient, it means high return results in high risk also. The formula for the regression is:

$$CAR_i: \beta_0 + \beta_1 \Delta ILLIQ_i + \beta_2 PRICE_i + \beta_3 \Delta VAR_i + \varepsilon_i$$

Description of the Samples

This study period focuses on bearish period (mid-1997 up to1999), in which Indonesia had experienced difficulties with liquidity, and most of the institutions and investors had lack of funds. The following table shows the split factors based on year.

Table 1 reports the split factors based on different years. Split factors are divided into three parts:- low split, medium split and high split. Almost all the samples in this study did split 2:1.

The Results

Paired Test result using Wilcoxon Signed-Rank Test

1. Transaction Cost Detection

a. *Relative Spread*

Table 2: The Result of Relative Spread During 1997-1999

1997-1999	Relative Spread	Change
Pre-Announcement Period	0.038948104	
Announcement Period	0.032025762	-0.006922324
Announcement-to-Ex Period	0.066437872	0.03441211
Ex-Date Period	0.092738621	0.026300749*
Short Term Post-Ex Period	0.086074873	0.006663748
Post-Ex period	0.043328489	-0.042746385

(**Note:** ***, **, * denote significance at the 1%, 5% and 10% levels)

b. *Zeros*

Table 3: The Result of Zeros During 1997-1999

1997-1999	Relative Spread	Change
Pre-Announcement		
Period	0.394166667	
Announcement Period	0.033333333	-0.060833333
Announcement-to-Ex		
Period	0.639975	0.0306641667***
Ex-Date Period	0.3	-0.339975***
Short Term Post-Ex Period	0.458329167	0.158329167**
Post-Ex period	0.492666667	0.0343375

(**Note:** ***, **, * denote significance at the 1%, 5% and 10% levels)

Basically, Relative Spread and Zeros are used to detect an increase or a decrease in transaction costs. Relative spread is measured by using the bid-ask spread. Table 2 shows that the change in the liquidity begins to occur around Ex-date period. Relative spreads are significantly increased in Ex-date period by 0.026300745, and then Relative spreads over the long term decline but are not sta-

tistically significant.

The results of the variable zeros in Table 3 indicate that after Announcement Period, there is a significant increase in zeros; however in Ex-date period, a contrary condition occurs. A significant decrease in zeros implies an increase in liquidity. However, after the Ex-date period, the amount of transaction costs is rising significantly. The amount of this increase tends to survive in the long run, although are not statistically significant.

2. Ability to Absorb Higher Transaction Value

Table 4: The Result of Volume During 1997-1999

1997-1999	Relative Spread	Change
Pre-Announcement Period	4036389	
Announcement Period	12883964	8847574.378
Announcement-to-Ex Period	7805491	-50787472.628
Ex-Date Period	2333177	-5472314.013
Short Term Post-Ex Period	1184436	-1148741.01
Post-Ex period	4315529	3131093.122

(**Noted:** ***, **, * denote significance at the 1%, 5% and 10% levels)

Table 4 shows that there is no significant increase in trading volume around the Announcement date and Ex-date, and the number of transactions tends to decrease after the ex-date to 1,184,436. The increasing trend in the volume or improvement in liquidity can be detected during the Post-Ex Period and this significant increase tends to survive in the long run.

3. Price Impact

Table 5: The Result of Amihud During 1997-1999

1997-1999	Relative Spread	Change
Pre-Announcement Period	5.50167E-05	
Announcement Period	0.013929134	0.013874118
Announcement-to-Ex Period	0.011935336	0.001993799
Ex-Date Period	0.058755375	0046820039
Short Term Post-Ex Period	0.036289351	-0.22466024
Post-Ex period	0.000433289	-0.035856061

(**Note:** ***, **, * denote significance at the 1%, 5% and 10% levels)

An increase in liquidity will occur if a larger trading volume would lead to a small price change. Table 5 reports that the large price changes happen during Announcement and Ex-date period which implies that there is no improvement in liquidity. However, significant increase in liquidity occurred during the Post-Ex date period based on the decreasing Amihud to 0.000433289.

4. Regression Results (Announcement and Ex-date Period)

From Table 6, the equation can be shown as:-

$$\mathbf{CAR = -0.030782 + 3.931968\Delta ILLIQ + 3.489162\Delta VAR - 0.0000595PRICE}$$

Based on the regression results in Table 6, it shows that, for 18.7% (R^2) variable CAR (cumulative abnormal return) can be explained by the vari-

Table 6: Regression Result for 1997-1999 Announcement Period

Dependent Variable: CAR				
Variable	**Coefficient**	**Std.Error**	**t-Statistic**	**Prob.**
C	-0.030782	0.082756	-0.371963	0.7138
ΔILLIQ	3.931968	1.904089	20.65013	0.0521
ΔVAR	3.489162	6.862644	0.508428	0.6167
PRICE	5.95E-05	8.51E-05	0.699323	0.4924
R-squared	0.187383	Mean dependent var		0.059977
Adjusted R-squared	0.06549	S.D. dependent var		0.25472
S.E. of regression	0.246238	Akaike info criterion		0.185973
Sum squared resid	1.21266	Schwarz criterion		0.382315
Log like lihood	1.768329	F-statistic		1.537277
Durbin-Watson stat	1.976364	Prob (F-statistic)		0.235728

Table 7: Regression Result for 1997-1999 Ex-date Period

Dependent Variable: CAR				
Variable	**Coefficient**	**Std.Error**	**t-Statistic**	**Prob.**
C	0.086867	0.071167	1.220599	0.2364
ΔILLIQ	-0006597	0.334162	-0.019741	0.9844
ΔVAR	2.978566	0.797407	3.735313	0.0013
PRICE	5.37E-05	6.46E-05	0.830718	0.4159
R-squared	0.413858	Mean dependent var		0.19311
Adjusted R-squared	0.325937	S.D. dependent var		0.235833
S.E. of regression	0.193622	Akaike info criterion		-0.294805
Sum squared resid	1.749791	Schwarz criterion		-0.098462
Log like lihood	7.537657	F-statistic		4.707142
Durbin-Watson stat	2.602968	Prob (F-statistic)		0.01209

able ΔILLIQ, ΔVAR, and PRICE, while the remaining of 81.3% is explained by other variables. The F-test results reports that the value of the F-statistic is not significant at any level of α. This indicates that, overall, all independent variables cannot explain the dependent variable, namely CAR. The partial test results also find no significant independent variables affecting the CAR variable except ΔILLIQ.

From table 7, the model can be shown as:-

CAR = 0.086867 - 0.006597ΔILLIQ + 2.978566ΔVAR + 0.0000537PRICE

The regression results indicate that the variable ΔILLIQ, ΔVAR and PRICE can explain the dependent variable (CAR) by 41.39% (R^2), the remaining of 58.61% is explained by other factors. F-statistic is significant at α = 1%, this indicates that overall, all the independent variables can explain the dependent variable or CAR. In a partial test, only the return variance (ΔVAR) significantly affects the CAR, while changes in illiquidity (ΔILLIQ) and the PRICE does not significantly affect the increase in CAR.

Coefficient value for ΔVAR of 2.978566 means that if the variable VAR rises by 1 unit, it will cause an increase in CAR of 2.978566 units, ceteris paribus. This indicates that the CAR and the return variance have a significant positive relationship. However, by considering the regression coefficient of return variance, it can be said that return variance is the independent variable that has a dominant influence on changes in CAR (cumulative abnormal return).

DISCUSSION

Based on the results, it is found that the most significant improvement in liquidity went on around Ex-date period and subsequent periods. This can be seen on all the variables used as the proxy for liquidity, such as Zeros: Announcement to Ex-date' to 'Ex-date period'; Volume: 'Post Ex-date period'; Amihud Illiquidity: 'Post Ex-date period'.

Stock split event caused a decrease in transaction costs (zeros) for the Announcement to Ex-date and Ex-date period. However, at the same time there is no significant decrease in the spread, in fact, it has a tendency to increase. The relative spread increases significantly in Announcement to Ex-date and Ex-date period. This increase shows that the investors might be competing to have the stock, which is now affordable. However, starting from Ex-date period, the spread tends to decline, means that there was an improvement in liquidity, although this was not statistically significant.

The other proxy, the volume, shows that it tends to decrease but increase in liquidity only after the ex-date period. The result from volume proves that, in this time frame, the increase in liquidity did not occur automatically after the stock split. However, the volume tended to decrease shortly after the ex-

date which is similar to the results found by Copeland (1979), Lamoureux & Poon (1987); Murray (1985). On the contrary, in the long-run, the volume is likely to increase (Gray et al. 2003). This condition was supported by a decrease in Amihud illiquidity ratio which is statistically significant for the long observation (Post-Ex period).

In connection with the period of crisis experienced by Indonesia in 1997-1999, the stock-split issuance shows a positive impact on the improvement of liquidity, particularly after the Ex-date period. This phenomenon is closely connected with the Trading Range where increasing liquidity theory occurred after ex-date (Huang et.al, 2007). This means that liquidity occurred because the company felt that the stock price is expensive and will reduce the company's ability to obtain funds. This condition is connected with the phenomena which happened in JCI during 1995-1997. Due to the excessive confidence, it pushed the stock prices higher, but when the contagious effect occurred, the investors began to withdraw funds, and companies needed to get fresh funds.

In line with the regression result, it is found that in Announcement Period, all independent variables cannot significantly explain the dependent variable. However in Ex-date period, the results show that the risk increases with the abnormal return. A change in return variance is the same as what was found by Huang et al. (2007), Lamoureux & Poon (1987), Dubofsky (1991), and Desai & Jane (1997) that the higher the variance is, the higher the return will be.

CONCLUSION

Results of this study has shown that the stock split helps increase the liquidity, which occurred in bearish condition (1997-1999). Improvement in liquidity is significantly found around the ex-date period.

According to the regression results in Ex-date period, it is proved that the main factor that significantly affects the existence of abnormal returns around the stock split issue is a change in return variance. This finding is similar to the study by Lamoureux & Poon (1987), Dubofsky (1991), Desai & Jane (1997), and Huang et al. (2007).

RECOMMENDATIONS

Based on this research, here are a few things that are recommended by the author in relation to the stock split and investment strategies in Indonesia in bearish condition:

1. Based on the results, it has been proven that the stock split is not just a cosmetic change, but it also helps improve the company's liquidity. Consequently, stock split may be a reference for companies that have problems in terms of liquidity.
2. In less conducive conditions, stock split will help improving liquidity, although not necessarily change the expected liquidity at Announcement and Ex-date.
3. Stock split becomes one of the main triggers for abnormal return, but the facts prove that the risks go hand in hand with an abnormal rate of return. An observation of each company is fundamental as an important reference in this regard.

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