

Stock Price Behavior in Dual Listing Stock on the Indonesia Stock Exchange and Newyork Stock Exchange

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Abstract: *This study was conducted to analyze the behavior of stock prices in dual listing stock on the Indonesia Stock Exchange and New York Stock Exchange. The subject was PT Telkom Jakarta. Data used were secondary data in the form of the closing price of the stock price, Jakarta Composite Index (JCI) and Newyork Stock Price Index, from June 2014 until December 2014. The data were tested using regression method, Error Correction Model, and processed using econometric views 7.0 with the confidence level of 5%. The results show the stock price of Telkom Newyork has significant effect on the stock price of Telkom Jakarta, while JCI and NYSE index do not have effect on the stock price of Telkom Jakarta. The stock prices of Telkom Jakarta and NYSE index have significant effect on the stock price of Telkom Newyork, while JCI does not affect the price of Telkom Newyork. There is a long-term equilibrium*

Keywords: *JCI, NYSEI., Dual listings, arbitrage.*

I. Introduction

The introduction of the paper should explain the nature of the problem, previous work, purpose, and the contribution of the paper. The contents of each section may be provided to understand easily about the paper. In the financial industry in Indonesia, companies such as PT. Indosat Tbk, PT. Tambang Timah Tbk, PT. Gulf Indonesia Resources Tbk, and PT. Telkom, Tbk have made a step forward by listing their stocks on the New York Stock Exchange and on the London Stock Exchange with the aims of seeking new sources of funding for their operations. It is realized the possibility of the difference in the exchange rate against dollar which would be profitable for the companies, because stocks that will be published abroad are sold in denominations with exchanges in those countries. . [1]. *Www.Oanda.Com*

From the standpoint of investors, dual listing performed PT Telkom Tbk, has created opportunities for investors to improve their investment portfolios. It is because the issuance of these stocks abroad (NYSE), the investors whose investment portfolio contain these stocks will be affected, in which prior to the dual listing the investors only use the consideration of information from the local stock exchange, whether it is the information of industry types, national economic conditions, and others, reflected from JCI, while after the dual listing, the prediction of risk and return will be complex because it requires consideration of information about the stock exchange in the countries in which the stocks are sold.

Dual listing arbitrage is the arbitrage transaction conducted on dual listings stocks with the goal that at a certain point the stock price on the two stock exchanges have a balanced value, arbitrage transaction is possible if the price of a stock is not in an equilibrium (a point where the stock price is not in balance point yet), the investor can obtain positive abnormal return. The investors operating globally in several world stock exchanges in general, take advantage of inefficiencies of a stock exchange. For example, of PT Telkom .Tbk on the JSE and the NYSE, can be analyzed that the arbitrage opportunity is likely to occur, in general stocks in emerging markets (such as IDX) have different characteristics with stock exchanges in developed countries. Such differences include the following: : [2] Eduardus Tadelilin

Characteristic differences between stock markets in developed countries and in emerging markets

Stock exchange in emerging market (IDX)	Stock exchange in developed country (NYSE)
-High market volatility, in US dollar Almost all emerging markets have volatility between 30-70% - High Risk - High Return - High market growth	- low volatility risk, in US dollar ± 15% - Risk is relatively low - Return is pararell with risk - Low market growth

Source: *Tandelilin 20011,337*

The low correlation between emerging market and stock markets in developed countries will provide an opportunity for investors to diversify internationally, meaning that if the capital markets of developing countries have low correlation, the changes in of economic cycle occurring in those countries would have less impact on the market in developed countries , another benefit for investors is access to information from

investors and the trade time difference among the exchanges existing in the world. The world capital market operates 24 hours a day. This condition can be explained as follows: [3]www.nyse.com

Schedule of exchanges trade existing in the world

Name of Exchanges	Countries	Trading Hour (opening)		Closing Hour (closing)		S
		Local Time :	WIB	Local Time:	WIB	
NYSE	USA	09.30 am	16.00	04.00 PM	04.00	-12
BEI/ JSI	Indonesia	09.30 WIB	09.30	16.00 WIB	16.00	0
Strait Times SE	Singapore	09.30 am	10.30	04.00 pm	17.00	-1
Nikkei	Japan	09.30am	11.30	04.00 pm	18.00	-2
LSE	England	09.30 am	10.30	04.00 pm	17.00	-1
Hang seng	Hongkong	09.30 am	10.25	04.00 pm	16.55	-55
Kuala Lumpur SE	Malaysia	09.30 am	09.30	04.00 pm	16.00	0
Sidney SE	Australia	09.30 am	12.30	04.00 pm	19.00	3

Source: www.nyse.com

Description: S is the time difference in unit

Market efficiency would happen if there are no hour limits between two capital markets, in which the stocks are traded together. However, there is still trade time difference among the world stock market and domestic capital markets, particularly those in Asia-Pacific. The objective of this research is to identify the behavior of dual listing stocks, that is to determine whether there is an opportunity or not to arbitrage, and to provide information to investors interested in international investment diversification on the behavior of dual listing stock prices. Therefore, this title of this research is "Analysis of Stock Price Behavior In Dual Listing Stocks on the Indonesia Stock Exchange and New York Stock Exchange".

II. Literature Review

State that the advantage of dual listing stocks is trade frequency efficiency can predict differences in capital markets, trade and arbitrage opportunity.

In price changes, stock is influenced by the flow of information received by the market. To test the information content, it involves only one factor that is abnormal returns, while to test the market efficiency in the information, it involves two factors: abnormal return and the rate of reaction.[4] Jogyanto Hartono 2007

Stock market price is market clearing price, which is determined by the forces of demand and supply. Stock prices provide an objective measure of the value of an investment in a company. Therefore, the stock price gives an indication of investor expectations change as a result of changes in financial performance. To see the reaction of stock price of an event, it can be analyzed by observing the variability of stock returns, calculated from the abnormal return of a company. Another way to look at the price reaction is the adjustment of company return with the market return at time t. The return adapted to the market is calculated by subtracting the market return at time t on company return [5] Shmuel Hauser, Yael Tanchuma

According [6] Richard Podpiera 2001, from the Return of dual listing stocks, it will be known issues of information flow among stock exchanges that trade the same stocks better and when the exchange is closed the information from other markets available to investors if the market is efficient, the information will be reflected in the price of the opening of stock trading.

Cross Border Listings_

It is a phenomenon of stocks listing on more than one exchange. The stock can be called a dual listing stocks. In general, the disclosure prerequisites appear as the most significant obstacles for listing abroad, for example, there is an adaptation to accounting regulations in the United States required by the US Security and Exchange Commission (SEC) and it turns out to emerge as an heavy obstacle that must be faced by companies outside the USA that want to do the listing on the NYSE

- American Depositary Receipt (ADR)

Dual listing on the United States stock market is performed by issuing ADR (American Depositary Receipt), which represents ownership of equity stocks of domestic companies (underlying asset). Equity stocks of domestic companies traded in the US market is not in the form of stocks (underlying asset), but in the form of ADR (representing underlying asset).This enables US investors to buy non-US company stocks without having to make cross-border transactions. Using ADR, stock price and dividend payments are available in USD denominations. Every ADR can represent multiple stocks and ADR holders have the right to acquire stocks (underlying asset) represented by the ADRs.

Arbitrage Opportunities

[7] Samuel Hauser, Rita Yankilevitz, Rami Yosef 20011, states that arbitrage opportunity is trading strategy, which is self-funded, which is capable of generating a profit without any risk at all. Arbitrage is closely related to the law of one price, which states that the same assets must be traded at the same price in all markets. Violation of the law of one price would lead to arbitrage opportunities for players participating in two or more markets in which the same assets are traded. By purchasing at a relatively lower price and selling at a higher price, arbitrage actors will get a risk-free profit.

Stock Price Index

It is number used to compare an event compared to other events. The index number can be used to make comparisons between the same activities (production, export, sales results, and so on) in two different times [8] J.Supranto 20011 The stock price index is comparing the stock price changes over time. In the measurement of the stock index and the stock price index we need also two kinds of time, i.e. base time and running time. The base time will be used as a basis of comparison, while the running time is the time in which the activities will be compared with the base time

Return

To make a return of a variable, it can be used arithmetic and geometric methods. Arithmetic method is performed by adding dividend with capital gains. The formula for the method is: [8]. Darmawan Achmad 2007

$$rt = \frac{Pt - Pt-1}{Pt-1} \times 100\%$$

Pt = asset prices / exchange rate on day t

Pt-1 = asset prices / exchange rate on day t-1

Error Correction Model

[9] Robert. F.Engle 2007 states that if both data being analyzed are not stationary but cointegrated with each other, it means that there is a long-term relationship (or equilibrium) between two variables. However, in the short term there may be lack disequilibrium. Error correction model is as follows:

$$\Delta Y = \alpha_0 + \alpha_1 \Delta X + \alpha_2 ut-1 + et$$

ut-1 is the error correction or residual lag 1 of the original equation, mathematically can be written as:

$$ut-1 = Yt-1 - \beta_0 - \beta Xt-1$$

III. Research Methods

Population and Sample

The research population was PT. Telkom listed on the Indonesia Stock Exchange and New York Stock Exchange in 2014. The samples were taken by using purposive sampling method with the criteria of, the Company listing on the Indonesia Stock Exchange and New York Stock Exchange during June 2014 until December 2014, and the similarity of the day, the same date on the Indonesia Stock Exchange with a New York Stock Exchange.

Operational Definition and Variable Measurement

Dependent Variable (Y):

Stock price is, the results obtained from an investment, measurement by reducing the stock price today with the stock price of the previous day, divided by the stock price of the previous day and multiplied by one hundred [10]. Eugene F. Brigham 2011

$$rtm = \frac{Pt - Pt-1}{Pt-1} \times 100$$

Pt - 1

Independent Variables (X):

JCI Return and NewYork return index, by reducing the stock price / index today with stock prices / index of the previous day, divided by stock price / index of one day earlier and multiplied by one hundred. .[11]. Eugene F. Brigham 2011

$$rtm = \frac{Pt - Pt-1}{Pt-1} \times 100$$

Pt - 1

Data Collection and The Techniques

This study used secondary data namely Telkom stock returns, JCI return and Newyork return index, using the techniques of documentation, taking notes, tabulating, then processed according to the needs of

research. The source of this data was obtained from the site [12] www.idx.co.id and from [13]. Yahoo!Finance, and the stock corner of UPN Veteran Jakarta (Online Trading Reliance securities).

Data Conversion Calculation

The converted data was the share price of PT. Telkom Newyork because it was still in US dollars per 1 (one) ADR. One ADR was equivalent to 40 shares. The stock prices in Newyork was made per share (in accordance with the ratio) multiplied by the exchange rate so that it became rupiah. [14 Schochrul Ajija et al 2011] From the data declared free from the classical assumption, it was then performed stationarity test to determine whether the data had a stable pattern, it was performed cointegration test and made residual series. Next, stationarity test was then performed to estimate the correction model, Then, it was performed statistical tests:

- Simultaneous Testing Regression Coefficient (Test F)

This test is used to look at the effect of independent variable (stock returns, JCI, stock index, Newyork returns index) simultaneously on the dependent variable (stock price), rejection or acceptance of the hypothesis is based on the level of significance (π) by 5%, when the probability value (p) > 0.05 then H_0 is rejected and if the value of the probability (P) < 0.05 then H_0 is accepted.

- The Coefficient Of Determination (R^2 Test)

It indicates closeness index stating the proportion of total variable Y (Stock price) that can be explained by variable X (stock returns, JCI, Newyork return index) of coefficient value of independent variables ability (variable X) in explaining the dependent variables, (variable Y).

- Partial Coefficient Test (T test)

This test is used to see the effect of each independent variable (stock returns, JCI, Newyork return index) on dependent variable (stock price), rejection and acceptance of the hypothesis is based on the level of significance (π) by 5% if the probability value (p) $> 0, 05$ then H_0 is rejected and if the value of the probability (P) < 0.05 then H_0 is accepted.

Stationarity Test

It is performed ADF (Augmented Dickey Fuller) test, the procedures performed:

H_0 : $Y = 0$: the level / return data are not stationary

H_1 : $Y = 0$: the level / return data are stationary

Critical value (CV) = $X_2, df: 2Y$

Test Cointegration

It is to determine whether there is a balance in the long term among the variables in the model. The cointegration used is [15] Engle-Granger 2007 cointegration test, because it is a single equation.

Error Correction Model Test

By using E-views 7, it is performed Error Correction Model with the following equation:

$$\Delta PBEIt = \gamma_1 + \gamma_2(PNYSEt-1 - PBEIt-1) + \gamma_3PNYSEt + \gamma_4IHSGt + vt$$

$$\Delta PNYSEt = \delta_1 + \delta_2(PBEIt-1 - PNYSEt-1) + \delta_3PBEIt + \delta_4IHNYt + wt$$

Where :

PBEI is TELKOM stock return on the IDX.

PNYSE is TELKOM stock return in New York.

IHSG (JCI) is return index value of IDX.

IHNY is return index value of NYSE.

$PNYSEt-1 - PBEIt-1$ and $PBEIt-1 - PNYSEt-1$ is the residual series.

vt and wt are white noise disturbance. [16] [http://teori online.word press.com](http://teori.online.wordpress.com)

Technique of Analysis and Testing of Hypothesis

To explain the relationship between dependent and independent variables, it was used multiple regression analysis technique with the computer program of Eviews 7. 0 (Econometric Views) [17] Schochrul Ajija 2011

Classic Assumption Test

It is performed to test the appropriateness of regression analysis model used in the study including, Test Multicolinerity, heterocedasticity test, autocorrelation test.

IV. Results And Discussion

Results

Descriptive statistical analysis

The mean values of closing price, Maximum value and Minimum value for New York Stock Price Index, Jakarta Composite Index, Telkom Jakarta and Telkom Newyork for Period June 2, 2014 until December 31, 2014 (in Rupiah)

	NYSE	JCI	TLKM JKT	TLKM NY
Mean	10827.68	5071.308	2716.479	13526.24
Median	10891.50	5093.400	2742.500	13643.87
Maximum	11104.72	5246.480	2945.000	14567.14
Minimum	10109.69	4838.980	2405.000	11665.63

Classical assumption test

It has fulfilled the requirements such as: Multicolinerity test, heterocedasticity test, Telkom Jakarta / Telkom Newyork and Autolorelation test. Therefore, the regression statistics test so that can be continued.

Simultaneous Regression Coefficient Statistical Test (F Test) of Telkom Jakarta

The significance value of $0.000 < 0,05$ so that H_0 is rejected, H_a is accepted that means simultaneously Telkom return in Jakarta, JCI, NYSE index significantly affect stock returns of Telkom in Newyork

Simultaneous Regression Coefficient Statistical Test (F Test) of Telkom Newyork

The significance value $0.000 < 0,05$ so that H_0 is rejected, H_a is accepted that means simultaneously Telkom return in Newyork, JCI, NYSE index significantly affect stock returns of Telkom in Jakarta.

Determination Coefficient Testing (R^2 Test) of Telkom Jakarta

The value of R_{square} is 0.598438, or 59.84%, Telkom Jakarta stock returns can be explained by Telkom stock return in Newyork, JCI and NYSE Index, while the remaining 40.16% is influenced by other factors.

Determination Coefficient Testing (R^2 Test) of Telkom New York

The value of R_{square} is 0.4817, or 48.17%, Telkom New York stock returns can be explained by its stock return in Newyork, JCI and NYSE Index, while the remaining 51.83% is influenced by other factors outside this study.

Partial Regression Coefficients Testing (T test) of Telkom Jakarta

The return Index of NYSE and JCI > 0.05 then H_0 is rejected and H_a is accepted, and significant levels of return of Telkom in NewYork < 0.05 then H_0 is rejected and H_a is accepted, meaning that Telkom NewYork has significant effect on the return of Telkom in Jakarta, while the returns of JCI and the NYSE do not affect the return of Telkom in Jakarta.

Partial Regression Coefficients Testing (T test) of TLKM_NY

The return of Telkom Jakarta and NYSE Index is < 0.05 then H_0 is rejected and H_a is accepted, and significant return of JCI is $> 0,05$, then H_0 is accepted and H_a is rejected, meaning that the returns of Telkom Jakarta and NYSE Index have significant effect on the return in New York, while the return of JCI does not affect the return of Telkom in NewYork

Stationarity Test

It is used ADF test (Augmented Dickey Fuller) because the value of ADF at the level of 1%, 5% and 10% is smaller than the critical value of McKinnon, then the analysis of ECM (Error Correction Mechanism) can be continued

Cointegration test of Telkom Jakarta

H_0 stating residual is stationary can be rejected because the p-value of ADF test has the value of 0.0000, this value is smaller than $\alpha = 5\%$,

Cointegration Test of Telkom Newyork

H_0 stating residual is not stasionary can be rejected, because the p-value of ADF test has the value of 0.0000, this value is smaller than $\alpha = 5$

Model Correction Error Test of Telkom Jakarta and Telkom Newyork

The result of Telkom Jakarta ECM is -0.790911 and significant at $\alpha = 5\%$ and has p - value of 0.0000. The results of Telkom NYSE ECM constants is -0.947316 and significant at $\alpha = 5\%$ and has p-value of 0.0000. These two coefficients show the adjustment reaction to short-term disequilibrium of long-term relationships possessed. It means if the stock price on the NYSE increases by 1%, then the stock price on the IDX will move by -0.790911, in the next period to maintain the long-term equilibrium. The p-value less than $\alpha = 5\%$ indicates that price adjustment occurs in two directions from IDX to NYSE. Likewise, for NYSE Telkom ECM constants can be interpreted if the Telkom stock price on the IDX increases 1%, then the stock price of Telkom on the NYSE will move by -0.947316 in the next period to maintain the long-term equilibrium. See p-value less than $\alpha = 5\%$ indicating that the price adjustment occurs in two directions from NYSE to IDX.

V. Discussion

[18] Liebermana et all 2009 , it is mentioned that Cointegration vector of (1, -1) indicates the absence of arbitrage opportunities at all, but if Cointegration vector is valued (1 - μ) where the value of μ is not equal to one, then the opposite situation occurs, i.e., there is an arbitrage opportunity. From the cointegration table of Telkom in Jakarta there is cointegrating vector of (1, -1.273200). While from the cointegration table of Telkom New York there is a cointegration vector of (1, -1.173200). The two μ values are not the same, meaning that there is arbitrage opportunity. According to [19] P. Roosenboom 2009 if there is arbitrage opportunity for traders, it is due to temporary price differences caused by:

a. Effect of exchange rate

Stock prices of Telkom on the NYSE are traded in the form of ADR (American Depositary Receipt) with the ratio for one ADR equivalent to 40 shares. The price difference is caused by the effect of exchange rate because if the exchange rate changes, the stock price data processed will change although actually the stock price of Telkom on the NYSE does not change.

b. Differences in market liquidity

Liquidity becomes the factors affecting the price difference, as many exchanges which have specific regulations so that there is a limit to the outgoing and incoming capital flows freely. These limits are able to make the low trading liquidity on the exchange and make the analysis of a study to be biased.

c. Differences trading hour

On the NYSE, the stock trading begins at 21:30 pm and the closing is 4:30 pm, on the IDX it begins at 10.00 am and the closing is 16:30 pm, There is difference between the closing on the NYSE and the opening on the IDX of about 5.5 hours while the closing on the IDX and opening on the NYSE is about 5 hour. These differences will result in delays in the transmission of information. Trading hour differences are able to make arbitrage activity obstructed, so that finally there is a price difference.

[20] Darmawan Ahmad, 2007, The results of ECM of Telkom Jakarta and ECM of Telkom NYSE put the stock returns of Telkom on the IDX as the dependent variable having a linear relationship on the difference in its stock price on both exchanges, the stock return of Telkom on the NYSE and return on the JCI. The results of ECM coefficient of Telkom Jakarta and ECM coefficient of Telkom NYSE is significant because the p-value of both coefficients are less than $\alpha = 5$, therefore it can be concluded that the stock return of Telkom on the IDX today can be clarified by the stock return of Telkom on the NYSE today.

Coefficient D (JCI) on the ECM of Telkom Jakarta and coefficient D (IHNY) are proved to be significant at $\alpha = 5\%$ since the p-value of 0.0000 of both coefficients describe the shares sensitivity of each market. It can be interpreted if the return index of JCI increases by 1% , then the stock return of Telkom on the IDX increases by 0.74%, and in the dual listing stocks of Telkom on the IDX and the NYSE, there is long-term equilibrium relationship, but there are also differences in price allowing the arbitrage.

VI. Conclusions And Recommendations

Conclusion

The objective of this study is to obtain evidence on the dual listing stock on the Indonesia Stock Exchange (IDX) and New York Stock Exchange (NYSE), that is the difference of speed in adjusting in the short term and long term differences, as well as the arbitrage opportunity between the Indonesia Stock Exchange and New York Stock Exchange. The conclusions are as follows:

1. There is arbitrage opportunity for both stocks, although it is very small. The potential arbitrage occurs because of the price difference between the prices in the two markets,
2. There is a long-term equilibrium relationship between the IDX and the NYSE.
3. There is a two-way information transfer, from the IDX to the NYSE or from the NYSE to the IDX.

4. The stock return of Telkom on IDX today can be explained by the stock return on the NYSE. The opposite situation is also applied, that the stock return of Telkom on the NYSE today can be explained by the stock return of Telkom on the IDX.
5. The stock return is sensitive to the exchange movement. So if the exchange index increases, it is most likely that the stock price will increase as well, and vice versa.

Suggestion

1. This research can be used as additional knowledge on the phenomenon of dual listing between the IDX and the NYSE.
2. This research uses a sample of 6 months, it is suggested to use longer sample (annual), in further research location. It can be performed on the London Stock Exchange (LSE) and Antam on the Australia Stock Exchange.
3. This paper gives information about the long-term relationship between the stock prices of Telkom on the two exchanges, so there is the possibility for investors to implement strategies to get benefits without risks.

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