



## ANALYZING TIME EFFECT IN THE PUSH AND PULL FACTORS AFFECTING FOREIGN PORTFOLIO INVESTMENT IN INDONESIA STOCK MARKET (CASE STUDY OF FOREIGN BUYING DURING THE PERIOD 2003-2018)

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**Abstract:** This study examined the influence of pull and push factors on foreign portfolio investment in Indonesia Stock Market. Two measures of foreign portfolio investment are foreign investor total buying and foreign investor net buying. The pull factors are represented by Return on Jakarta Composite Index, Jakarta Stock Market liquidity, IDR Exchange Rate, and Inflation Rate. The push factors included are return on Dow Jones Industrial Average, Yield on US Treasury Bill, and return on Gold. This study takes Foreign Investor Total Buying and Foreign Investor Net Buying as dependent variables. To accommodate time or year effect, a panel data regression is employed as analytical tool. Processing monthly data from January 2003 to December 2018, and using Foreign Investor Total Buying as dependent variable, this study finds that exchange rate and stock market liquidity affect the foreign investor total buying significantly. The negative coefficients of exchange rate and the positive coefficient of stock market liquidity support the hypotheses. The regression on Net Buying shows that exchange rate, stock market return, and stock market liquidity affect foreign investor net buying significantly. The negative coefficient of exchange rate and positive coefficient of stock market return support the hypotheses while the negative coefficient of stock market liquidity does not. The individual year fixed effect and individual year random are present in the first and second regressions respectively. In both regressions, no variables in push factors affect foreign portfolio investment significantly. hence, the foreign portfolio investment in Indonesia is affected only by pull factors.

**Keywords: Foreign Portfolio Investment, Push Factor, Pull Factor, Indonesia Stock Market**

### INTRODUCTION

Indonesia capital market offers attractive investment opportunities for foreign investors. Continuously increasing stock market index from 2003 to 2018 and relatively its low correlation, for example with DJIA, can contribute positively in trade-off of risk and return. Solnik and McLeavey (2003) suggested that increasing index and low correlation are measures of stock

market attractiveness of emerging markets. Foreign portfolio investment (FPI) is very valuable for a country like Indonesia. Foreign capital provides sources of funds for domestic companies and has a positive impact on employment and income. Foreign portfolio investment increases the liquidity of Indonesian capital market. For foreign portfolio investors, Bley and Saad (2011) and Naceur et al (2008) argued that liberalization of emerging capital market gives foreign investors an opportunity to obtain high return and international diversification. Bouslama and Ouda (2014) found that a substantial investment in emerging market enhances economic gain resulted from diversified portfolio and consistently improve the risk. According to UNCTAD (1999), the inflow of capital will increase the availability of financial resources for domestic investments, become complement for domestic savings, provide the foreign exchange to support balance of payments, support economic development and many others. Furthermore, FPI can bring benefits through increasing the liquidity of domestic capital markets, encourage the development of other financial intermediaries, strengthen the financial infrastructure and deepen the process of financial intermediation. FPI can encourage the practice of good corporate governance, since foreign investors require companies more transparent. The activities of foreign portfolio investors have increased the liquidity of Indonesian stock market and have become sources of funds for Indonesian companies through IPOs. To maintain foreign investors presence, Indonesia capital market authority needs to know the factors that are attractive to them.

Bley and Saad (2011) argued the benefits from foreign investors are not without cost. The financial liberalization increases stock market volatility. This in turn will disturb the allocation of financial resources and thus affects the performance of capital market negatively. UNCTAD (1999) suggested that volatility of capital flows is characterized by a high reversibility frequency of flows or by a high variability in the capital inflow volumes. Reversibility and variability result from the fact that capital flows are very sensitive to changes in their determinants. Furthermore, the negative side of portfolio capital flow can become burden for the host country balance of payments if the cost exceeds the benefit. Such costs primarily include interest and dividend payments to foreign investors. Also unexpected reversal of investment flows can be detrimental to economic development as it induces instability in economic variables.

Since the inflow of foreign portfolio investment brings cost and benefit, Indonesian capital market authority need to create a capital market environment in such a way that it can attract foreign portfolio investors without creating the instability in economic variables. The foreign capital flow is expected to bring many benefits to Indonesia. The inflow of foreign capital into Jakarta Stock Market have increased the activity of Indonesia capital market and as funding sources for domestic companies initiating public offering. Foreign investors brought in foreign exchange needed to maintain domestic currency exchange rate. Even though the nature of this foreign portfolio investment is short-term, their presence must be maintained by creating various attractive factors for foreign investors.

Diversifying internationally, foreign investors should put many factors into consideration. Elton et al (2010, 254) listed factors that have to be considered. These factors include the correlation among stock markets, risk inherent in each market, and return expected. If the correlation between domestic stock return and stock return abroad is less than 1 or negative, then international diversification will reduce portfolio risk in term of variance or standard deviation of return.

Many studies have examined the determinants of the inflow of foreign portfolio investment into a particular country. Kim et al (2013) included such factors as host country inflation rate, interest rate, stock index return, as determinants of a portfolio capital inflows. Siamwalla et al

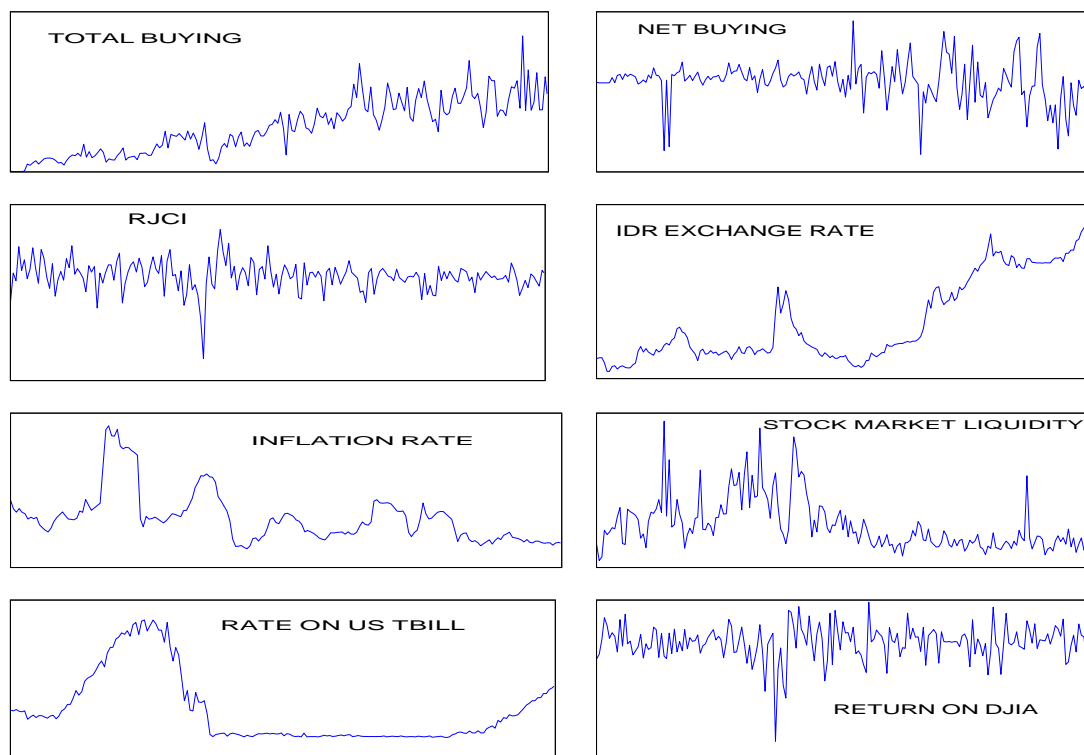
(1999) added Economic Growth dan swap rate. Dua and Garg (2013) included exchange rate, foreign exchange reserve to import ratio, and interest rate differential with LIBOR. Aziz et al (2015) added average import and export as well as market capitalization.

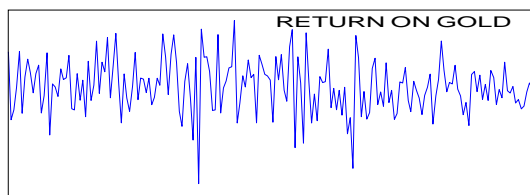
This current study examines empirically the influence of pull factors and push factors on foreign portfolio investment flow to Indonesia. The pull factors included are Jakarta stock market return, stock market liquidity, IDR exchange rate, and inflation rate. The push factors used in this study are the yield on US Treasury Bill, return on Dow Jones Industrial Average, and return on Gold. In general, investors expect to get high return on his investment. A well performing domestic stock market attracts portfolio inflows. Indonesia stock market return will become attractive if it offers higher return compared to that in any other place. The fact that foreign investors need to convert their investment proceeds into their own currency, the IDR exchange rate should be added as a pull factor. An appreciating IDR exchange rate will attract portfolio flows

This research differs from previous research in two aspects. First, this research adds stock market liquidity as a pull factor. Second, this research adds time effect on foreign portfolio investment flow to Indonesia.

The behavior of total buying and net buying of foreign investors in Jakarta Stock Exchange was very different. Total buying tends to increase over time and net buying tends to stay horizontally. These phenomena provide a justification of using two dependent variables, Total buying and Net buying. During study period from January 2003 to December 2018, the behavior of total buying and net buying of foreign investors was both very volatile. The volatility of foreign portfolio investment will have a significant effect on IDR exchange rate. In order to control the volatility of foreign portfolio investment, what determines the volume of foreign portfolio investment should be investigated.

Figure 1, The historical trends of Foreign Buying and the Determinants.





The figure depicted above shows that foreign investors total buying and net buying fluctuated over time. Even though total buying and net buying fluctuated, their trends differ. The total buying show an increasing trend while net buying shows a horizontal behavior. The return on Jakarta Composite Index shows a fluctuated behavior indicating the presence of trading opportunity that may attract foreign investors. Inflation rate shows a decreasing trend recently. The yield on US Treasury Bill, even though it fluctuates as depicted in the graph, the trend tend to decrease. This situation might be a reason for the increasing of foreign buying. The figure shows that the liquidity of stock market tend to be stable and IDR exchange rate fluctuate over time. During the same period, foreign buying also fluctuates over time. This can be an indication of dependence of foreign buying on the liquidity of stock market and IDR exchange rate. The return on DJIA and return on Gold fluctuated but stay horizontally.

The findings of previous studies using other countries' data need to be reexamined using Indonesia data. Reexamination is also needed since the previous findings were not consistent. For example, Haider et al (2016) found that foreign exchange rate affect foreign portfolio investment in China with a negative sign. Azis et al (2015) found that foreign exchange rate did affect foreign portfolio investment in Pakistan. Dua dan Garg (2013) found that the exchange rate had significant influence positively on foreign portfolio investment inflow to India.

Dua and Grag (2013) found that Stock Market Index had positive and significant influence on foreign portfolio investment inflow to India. Kim et al (2013) found that stock market return had no significant influence on foreign portfolio investment inflow to South Korea. Kim, Kim dan Choi (2013) found that Inflation Rate had significant influence negatively on foreign portfolio investment inflow to South Korea. Azis et al (2015) found that Inflation rate had significant influence positively on foreign portfolio investment inflow to Pakistan

Kim et al (2013) found that the world interest rate had no significant effect foreign portfolio investment inflow to South Korea. Dua dan Garg (2013) found that the world interest rate had a significant and positive influence on foreign portfolio investment inflow to India.

## LITERATURE REVIEW

### 2.1. International Investing: Benefits and Constraints

Foreign portfolio investors will have two benefits by investing internationally. The first benefit is that the investor will have more alternatives available compared to investing only domestically. The second benefit is that international investing give the opportunity to get better risk-return trade-off. According to Eiteman et al (2004, 631), by diversifying the portfolio internationally, portfolio beta, the level of systematic risk, is lowered. According to Solnik and McLeavey (2003, p. 142), there are some impediments to capital mobility internationally. Psychological factors or unfamiliarity with foreign stock marketes, language, sources of information, all might prevent foreign investments. Also legal restrictions that limits foreign ownership. Transactions costs in foreign market might be higher such as brokerage and management fees. There might be tax discrimination includes withholding taxes, political risk, and currency risk.

## 2.2. Theoretical Concepts

The foreign portfolio investment theory of Hymer (1976) stated that foreign portfolio investors are attracted by high interest rate in host country. They continue to invest until the worldwide interest rate become the same. This theory is criticized, for example Waqasa et al (2015), criticized the theory since it did not put into consideration the risk factors. The related risks include foreign exchange risk, inflation risk, stock market return, and liquidity. The international finance theory states that the goals of investors conducting cross-country diversification are to reduce the risk and to obtain higher return (Singhania and Saini, 2017). Feddeke and Liu (2002) developed Portfolio Allocation Model (PAM), which postulates that capital flows are driven by two classes of determinants which are rates of return and risk factors with positive responses to rates of return and negative response to risk.

The theoretical portfolio balance model was developed by Fernandez- Arias and Montiel (1995). The theory suggested that some factors determined financial capital flows. According to this model, foreign investors will exploit all the possibilities of arbitrage across the home and the host country. This model analyses the effect of domestic, called pull, factors and global, called push, factors on capital flows. According to Dua and Garg (2013), pull factors represent country specific investment risk and returns which attract foreign portfolio investment and push factors represent global liquidity and other factors that push foreign investment towards host countries. Dua and Garg (2013) included domestic stock market performance, exchange rate, domestic interest rate, domestic output growth and volatility in exchange rate as pull factors. For push factors, these authors included foreign interest rate and foreign output growth. Pull factors give investors an opportunity to get a relatively high rate of return investing in host countries (Humanicki et al 2013). Taylor and Sarno (1997) defined push factors as global factors and pull factors as country specific factors.

According to Sarno et al (2014) push factors are external to the countries receiving the capital flows, whereas pull factors are internal to these host countries. In the case of capital flows from the US to other countries, Sarno et al (2014) defined push factors are those reflecting the global economic forces that push capital from US investors to other countries. These push factors may be related to low US interest rates, low US growth potential, etc. Pull factors reflect the host countries forces that pull capital that include high domestic interest rates, growth potential, trade openness, or low domestic inflation

Humanicki et al (2013) defined push factors as global factors and pull factors as country-specific factors. Humanicki et al (2013) noted specific host country factors that attracted foreign investors called pull factors. These factors included the growth of economic output which would contribute high return on investment. There were also primary push factors that usually external factors to the host country such as low return in the home country of investors, the changing conditions in the world economy, international financial markets such as the US output growth, the US interest rates. The pull factors reflected both return opportunity and investment risk of the host country such as stock market return, country's credit rating, its investment climate and credit rating, financial openness, the level of external debt and foreign exchange reserves, interest rates, etc.

## 2.3. Pull and Push Factors Related to Indonesia Stock Market

The followings are pull and push factors used in this study as determinants of foreign portfolio investment in Indonesia Stock Market.

**The pull factors included in this study are:**

- a) Indonesia stock market performance measured by Jakarta Composite Index (JCI) return. The higher stock index return in Indonesia would affect the inflow of foreign capital positively if the objective is to obtain higher return. An increase in stock index can be a signal of increasing dividend and (Saunders and Cornett 2004, p245)
- b) The exchange rate measured by IDR/USD  
This study uses the exchange rate of IDR/USD since the USD is the investment currency in most capital market (Daniels et al 2009, p 381). The depreciation of foreign currency is the risk facing foreign investors (Madura, 2006, 89). Investment in foreign stock has two aspects, the security investment itself and foreign currency (Sharpe, et al 1995, p 971). There are two sources of return, the return from increasing stock price and the return from foreign currency appreciation. According to Solnik and McLeavey (2004), even though currency risk can be hedged by derivatives, this hedging leads to additional administrative and trading costs.
- c) Domestic (Indonesia) Inflation Rate  
Unexpected increase in inflation rate will have a negative impact on stock price (Solnik and McLeavey 2004 p 295). Regarding the effect of inflation, some stocks are more sensitive to inflation such as luxury good producers, less sensitive to inflation such as food and cosmetics, while real estate stock benefited from inflation (Solnik and McLeavey 2004 p 295). Also, a higher inflation rate discourages investment because it reduces the actual return of investors
- d) Indonesian stock market liquidity  
A liquid stock market allows investor to buy or sell the common stock without taking a long time. In liquid stock market, there are many sellers and buyers. For investors to rebalance their portfolio, a liquid stock market is needed for executing buying and selling activities quickly without a long waiting time. Transaction volume could be an indication on the liquidity of market. (Solnik 2004, 197). Illiquidity implied higher transaction cost for investors. Liquidity sometimes is interpreted as marketability (Pratt et al 1996, 333). This study defines liquidity as the time required to convert an asset into cash.

**The push factors included in this study are:**

- e) Return on DJIA  
The lower return on world stock markets can be a push factor to enter Indonesian stock markets. Foreign portfolio investor will enter Indonesia stock market as long as the return in other part of the world is lower than that in Indonesia.
- f) The return on Gold  
Gold in an alternative investment vehicle available for foreign investors. This study believe that the return on gold will be put into consideration by foreign portfolio investors. The higher the return on gold the lower the amount of foreign portfolio investment
- g) Return or yield on US Treasury Bill. Foreign portfolio investors will enter domestic market if the the world interest rate is lower than the stock return in Indonesia. The yield on US Treasury Bill can be used as representing the world interest rate.

**2.4. The Time or Year Effect on Foreign Portfolio Investment**

The effect of time, in this study is defined as the effect of individual year. This effect will be analyzed using panel data regression. Econometrically, the equation for panel data regression is as follow:  $Y_{it} = \alpha + \beta X_{it} + \mu_{it}$

where  $Y_{it}$  and  $X_{it}$  are dependent variable and explanatory variables respectively. Then  $\alpha$  is the intercept term and  $\beta$  is a vector of parameters. The notation  $i = 1, \dots, N$  represent year, and  $t =$

1,.....  $T$  represent months. Three models will be investigated: common effect, fixed effect, and random effect. Common effect model is a single model that fit for all years.

For a fixed effect model , the disturbance term  $\mu_{it}$  is decomposed into individual specific effect  $\mu_i$  and  $v_{it}$  as remainder disturbance that varies from time to time and from entity to entity capturing everything that is left unexplained about  $Y_{it}$  (Brooks, 2014). So the fixed effect equation could be written as :

$$Y_{it} = \alpha + \beta X_{it} + \mu_i + v_{it}$$

Brooks (2014) interpreted  $\mu_i$  as encapsulating all of the variables that affect  $Y_{it}$  cross-sectionally but do not vary overtime. Estimating this model, we could use dummy variables termed the least square dummy variable (LSDV) regression approach

$$Y_{it} = \beta X_{it} + \mu_1 D1_i + \mu_2 D2_i + \dots + \mu_N D N_i + v_{it}$$

Instead of individual entity specific effect or entity-fixed effect model, this study would use time-fixed effect model. Hence, applying time –fixed effects, the regression intercepts would vary from year to year

The idea is that the average value of  $Y_{it}$  varies over time instead of cross-sectionally. With time–fixed effects, the intercepts would vary over time but would be the same across entities at each given point in time. This time-fixed effect model is written as

$$Y_{it} = \alpha + \beta X_{it} + \lambda_t + v_{it}$$

Where  $\lambda_t$  is an intercept that varies over time and constant cross-sectionally. The model of least squares dummy variables model is estimated using the following equation (Brooks ,2014)

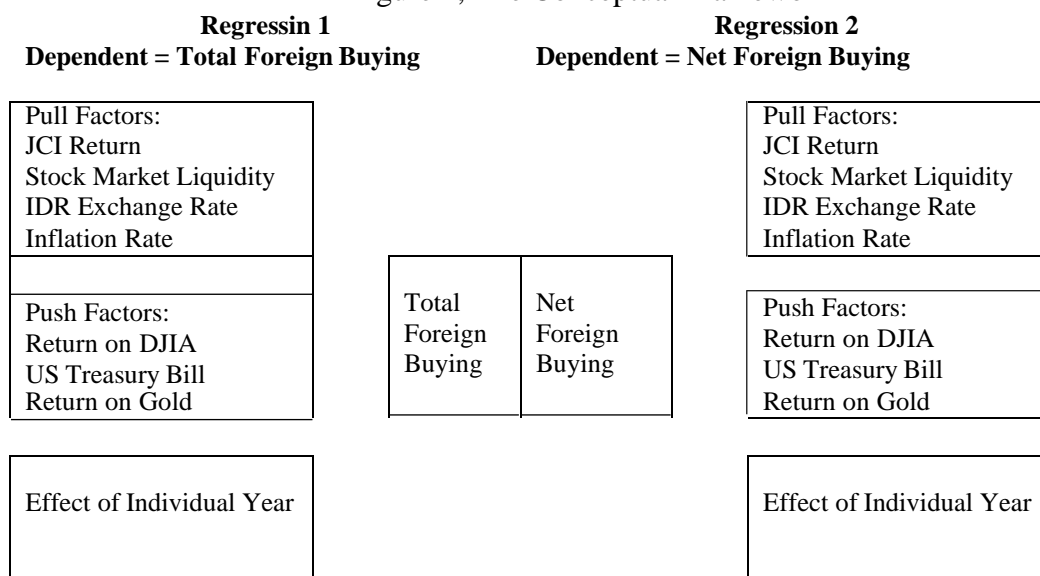
$$Y_{it} = \beta X_{it} + \lambda_1 D1_t + \lambda_2 D2_t + \dots + \lambda_T D T_t + v_{it}$$

Where  $D1_t$ , for example, denotes a dummy variables that takes the value 1 for the first time period and zero otherwise, and so on. Now the dummy variables represent time variation instead of cross-sectional variations. The third model is the random effect model. The choice between common effect and fixed effect models will use the Chow or F-test. If the fixed effect is chosen, then the Hausman test is used for the choice between the fixed effect and random effect models.

### 2.6. Conceptual Framework

The framework of this study is presented in the figure below:

Figure 2, The Conceptual Framework





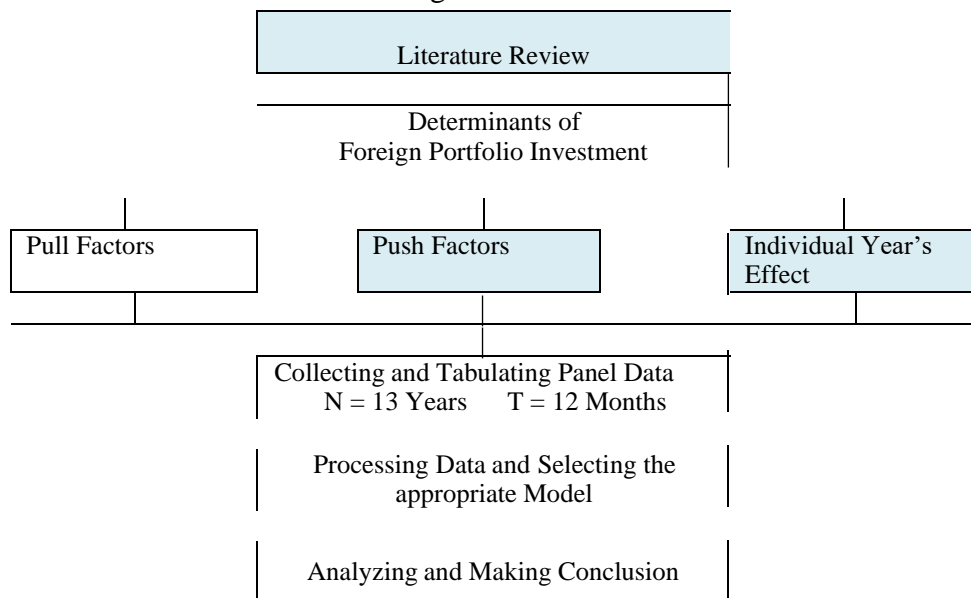
**RESEARCH METHODS**

**3.1. Research Design**

Two measures of foreign portfolio inflows used in this study are Total Buying and Net Buying. Net buying of a particular month is defined as total buying minus total selling at the same month. The regressions on Total Buying and on Net Buying employ the same independent variables. This independent variables grouped into pull factors and push factors. The pull factors include domestic inflation, exchange rate, return on jakarta composite index, the liquidity of jakarta stock market. The push factors include return on DJIA, yield on US Treasury Bills, and Return on gold. In addition, the time period effect will be included in the analysis. For this reason, a panel data regression is considered appropriate.

This study is designed and based on the following flowchart:

Figure 3. Flowchart



There are many variables could be grouped into pull and push factors. This empirical study includes return on Jakarta composite index, domestic inflation, exchange rate, and stock market liquidity as pull factors. For push factors, this study includes return on Dow Jones Industrial Average, yield on Treasury Bill, and return on gold. Individual year’s effect include year 1, year 2, up to year 16. This represents the period of study from January 2003 until December 2018 or 16 years.

As the analytical tool, this study uses Panel Data regression model to see whether the time effect is present in examining the determinants of foreign portfolio investment. In this study, the empirical data have N = 16 from 2003 to 2018, and T = 12 ( January up to December)

**3.2. Empirical Models**

This study examines the effect of push and pull factors as well as the effect of time on foreigner behavior in terms of their buying volumes at Indonesian Stock Exchange. Regression on panel data

can be used to assess the relationships amongst the relevant variables as well as the effect of time

or year on the dependent variables. The first regression uses Foreign Investors Total Buying and the second one uses Foreign Investors Net Buying. These two regressions are formulated in the following equations:

$$\text{TOTALBUY}_{it} = \alpha + \beta_1 \text{RJCI}_{it} + \beta_2 \text{LIQUIDITY}_{it} + \beta_3 \text{XRATE}_{it} + \beta_4 \text{INFLATION}_{it} + \beta_5 \text{TBILL}_{it} + \beta_6 \text{RDJIA}_{it} + \beta_7 \text{RGOLD}_{it} + \varepsilon_{it}$$

$$\text{NETBUY}_{it} = \varphi + \lambda_1 \text{RJCI}_{it} + \lambda_2 \text{LIQUIDITY}_{it} + \lambda_3 \text{XRATE}_{it} + \lambda_4 \text{INFLATION}_{it} + \lambda_5 \text{TBILL}_{it} + \lambda_6 \text{RDJIA}_{it} + \lambda_7 \text{RGOLD}_{it} + \nu_{it}$$

The followings are the explanation of each notation as follows

Dependent variables

NETBUY= Foreign investor net buying

TOTALBUY = Foreign investor total buying

The Pull factors are:

RJCI = Return on Jakarta Composite Stock Index

LIQUIDITY = Indonesia stock market liquidity

XRATE = Exchange rate of IDR/ USD

INFLATION= Domestic (Indonesia) Inflation rate

The Push factors are:

TBILL =Return on US Treasury Bill

RGOLD =Return on Gold

RDJIA = Return on Dow Jones Industrial Average

$\alpha$  and  $\varphi$  = Constant or intercept

$\beta_1 \beta_2 \beta_3 \beta_4 \beta_5 \beta_6$  and  $\beta_7$  = the coefficients of determinant variables

$\lambda_1 \lambda_2 \lambda_3 \lambda_4 \lambda_5 \lambda_6$  and  $\lambda_7$  = the coefficients of determinant variables

$\varepsilon$  and  $\nu$  = residual atau error

The subscript  $i$  represents year and  $t$  represents month. In this model  $i = 2003, 2004, \dots, 2018$  and  $t = \text{month } 1, \text{ month } 2, \dots, \text{month } 12$ .

### 3.3. Data and Sources

Data for this empirical study consist of monthly secondary data from 2003-2018. The effective sample of data covers monthly data for the period January 2003- December 2018. The data used were obtained from various sources that include the Central Bank, Indonesia Financial Service Authority or Otoritas Jasa Keuangan (OJK), Jakarta Stock Exchange (Market) dan Central Bureau of Statistics. The data collected include macroeconomic and financial variables. The followings are the data needed and collected.

1. Total foreign buying on stock from Statistic on Indonesia Capital Market
2. Net foreign buying on stock from Statistic on Indonesia Capital Market
3. Jakarta Composite Stock Index from Statistic on Indonesia Capital Market
4. Trading Volumes and Market Capitalization from Statistic on Indonesia Capital Market
5. Exchange rate of IDR/ USD at X-rate
6. Domestic (Indonesia) Inflation rate from Indonesia Central Bank
7. Return on US Treasury Bill from US Department of Treasury
8. Dow Jones Industrial Average from Statistic on Indonesia Capital Market
9. Gold Prices from [sdbullion.com/gold-prices](http://sdbullion.com/gold-prices)

### 3.4. Measurements of Variables

This study employs 7 independent variables for each of 2 dependent variables. The followings are the definitions of each variable in the model.

The Dependent Variables

- 1) Foreign buying total (TOTALBUY) : Total purchase of foreigner each month at Indonesian Stock Market.
- 2) Foreign Buying Net (NETBUY) : Total purchase of foreigner minus total sales each month at Indonesian Stock Market

The pull factors:

- (1) Return on Jakarta stock index (RIHSG) : Return on Jakarta Composite Stock Index  
 Monthly return on IHSG  $= \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}$   
 The annualized return or RIHSG  $= (1 + \text{Monthly return})^{12} - 1$
- (2) Liquidity of Indonesian Stock Market  $= \frac{\text{Monthly Transaction volume}}{\text{Market Capitalization at Month End}}$
- (3) IDR exchange rate (XRATE) = The number of IDR per one US dollar
- (4) Inflation rate ( INFLATION ) = Indonesia national monthly annualized inflation rate

The push factors

- (5) Return on Gold  $= \frac{GOLD_t - GOLD_{t-1}}{GOLD_{t-1}}$   
 The annualized return or RGOLD  $= (1 + \text{Monthly return})^{12} - 1$
- (6) Return on Treasury Bill = Bank Discount rate on 4 week maturity TB annualized
- (7) Return on Dow Jones (RDJIA) : Monthly Return on Dow Jones Industrial Average  
 Monthly return on DJIA  $= \frac{DJIA_t - DJIA_{t-1}}{DJIA_{t-1}}$   
 Annualized return = RDJIA  $= (1 + \text{Monthly return})^{12} - 1$

### 3.5. Analytical Models

This study tests the effect of push and pull factors as well as the effect of individual year on foreigner behavior in terms of their buying at Indonesian Stock Exchange. This empirical study uses panel data regression as analytical tool. Three alternative models will be evaluated before selecting one of them. The three models are the common effect model followed by the time-fixed effect model and random effect model. The panel data regression allows the effect of individual years to be included in the model represented by different intercept for each year

#### The steps taken in selecting the representative model

In order to get a representative model two tests were conducted. The Chow test setting the null hypothesis that common effect model is better than fixed effect model. The next step is to examine the applicability between fixed effect model and random effect model using Hausman test. The Hausman test will determine the choice between fixed effect model and random effect model . The null hypothesis is that random effect model is better than fixed effect model.

#### Examining the significant effect of individual variables

Based on the model selected, each regression coefficient will be evaluated its significant influence using t-test. The null hypothesis will be there is no significant influence of the variable on the volume of foreign investor buying. The formal notation will be:

$H_0: \beta_i = 0$  means no significant influence of variable  $i$  on foreign portfolio investment, alternatively  $H_a: \beta_i \neq 0$  which means that the influence of variable  $i$  is significant. In this test *iare* RJCI, LIQUIDITY, XRATE, INFLATION, TBILL, RDJIA, RGOLD

**Examining the significant effect of all individual variables together**

Also based on the model selected, the significant influence of all independent variables together will be evaluated their significant influence using F-test. The formulation of F-test is:

$H_0 : \beta_1 = \beta_2 = \beta_3 = \dots = \beta_n = 0$ , that is, there is no significant influence of all independent variables together on foreign investor buying. Alternatively  $H_a$ : not all  $\beta$ 's equal zero.

**FINDINGS AND DISCUSSION**

**4.1. Correlations Among Independent Variables**

Examining the independent variables which cannot be included in the model, this study investigated the following correlation matrix for all explanatory variables.

Table 1. Correlation Matrix Among Independent Variables

	INFL	RJCI	XRATE	LIQ	RTBILL	RDJIA	RGOLD
INFL	1.000	-0.082	-0.311	0.171	0.496	-0.136	0.074
RJCI	-0.082	1.000	-0.170	0.013	0.079	0.436	0.217
XRATE	-0.310	-0.170	1.000	-0.395	-0.252	-0.056	-0.116
LIQ	0.171	0.013	-0.395	1.000	0.353	-0.042	0.025
RTBILL	0.496	0.079	-0.252	0.353	1.000	-0.024	0.098
RDJIA	-0.136	0.436	-0.056	-0.042	-0.024	1.000	0.097
RGOLD	0.074	0.212	-0.116	0.025	0.098	0.097	1.000

The correlation figures in the table above are relatively low, below 0.5, so that there is no presence of serious multicollinearity problem.

**4.2. Panel Data Regression on Total Buying**

Processing the data, this study found that Regression on Total Buying follows a fixed effect model. For regression on Total Buying, the test produced a cross-section F statistic of 24.713685 with prob 0.0000. This result rejected the null that the accepted model is common effect model. Then, the Hausman test produced a chi-square statistic of 76.158 with prob 0.000. This finding rejects the null that the accepted model is random effect. Hence, for the regression on Total Buy, the model accepted was the Fixed Effect model. The produced regression on Total Buying using of fixed effect model is presented in Table 2.

Table 2 . Fixed Effect Model for Total Buying

Dependent Variable: Total Buying			
	Coefficient	t-Statistic	Prob.
<b>PULL FACTORS:</b>			
INFLATION?	158.2606	0.480294	0.6316
XRATE?	-6.058460	-4.536092	0.0000
RJCI?	-134.8029	-1.024187	0.3072
LIQUIDITY?	2834.581	4.586236	0.0000
<b>PUSH FACTORS</b>			
RTBILL?	-752.7661	-0.412611	0.6804
RDJIA?	23.46113	0.123970	0.9015
RGOLD?	-29.09083	-0.233385	0.8157
Fixed Effects (Time)	Intercept	Fixed Effects (Time)	Intercept

YEAR1	47731.44	YEAR9	78399.86
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YEAR2	53717.63	YEAR10	90199.269
YEAR3	60314.91	YEAR11	107336.18
YEAR4	58694.51	YEAR12	114671.81
YEAR5	63301.82	YEAR13	123444.57
YEAR6	66933.75	YEAR14	130224.62
YEAR7	67620.51	YEAR15	128160.17
YEAR8	73817.6	YEAR16	140836.46
F-statistics	50.33474	Rsquare	0.867593
Prob	0.000000	Adj Rsquare	0.850356
Durbin-Watson stat	2.094244		

Table 2. shows that there are 7 independent variables examined in the model. As many as 5 variables did not have significant influence on investors total buying. These 5 variables are inflation rate, return on Jakarta Composite Index, return on US TBill, return on DJIA, and return on Gold. They have a t-statistic with corresponding Prob is greater than 0.05. The two variables that had significant influence are exchange rate and stockmarket liquidity. These two variables have a t-statistic with corresponding Prob is less than 0.05. Exchange rate has a negatif coefficient as expected and Stock market liquidity also has a positive coefficient as expected. Both variables that affect foreign investor total buying significantly belong to pull factors. No any push factors affect foreign investor total buying significantly. The individual year effects are represented by the different intercepts for each years. These intercepts are also reported in the table above.

#### 4.3. Panel Data Regression on Net Buying

This study shows that Regression on Net Buying follows a random effect model. The test produced cross-section F statistic of 1.635 with prob 0.0692. Since the Prob is greater than 5%, the result rejected the null that the accepted model is common effect model. Continuing to the The Hausman test produced the chi-square statistic of 7.120 with prob 0.4165 This result does not reject the null that the accepted model is random effect. Hence, for the regression on Net Buy, the model accepted was the random Effect model.

Table 3 . Random Effect Model for Net Buying

Dependent Variable: Net Buy			
	Coefficient	t-Statistic	Prob.
<b>PULL FACTORS</b>			
INFLATION?	106.8370	0.675639	0.5001
XRATE?	-0.782569	-2.756785	0.0064
RJCI?	205.0494	2.463827	0.0147
LIQUIDITY?	-567.4462	-1.754257	0.0811
<b>PUSH FACTORS</b>			
RTBILL?	-199.3346	-0.522131	0.6022
RDJIA?	58.81156	0.491332	0.6238
RGOLD?	115.5404	1.437331	0.1523
Random Effects (Cross)	Intercept	Random Effects (Cross)	Intercept
YEAR1	8762.412	YEAR9	8762.412
YEAR2	9710.523	YEAR10	9710.523
YEAR3	8993.771	YEAR11	8993.771
YEAR4	9512.427	YEAR12	9512.427
YEAR5	10854.81	YEAR13	10854.81
YEAR6	11045.11	YEAR14	11045.11
YEAR7	10058.03	YEAR15	10058.03

YEAR8	9648.859	YEAR16	9648.859
F-statistics	4.102841	Rsquare	0.135013
Prob	0.000327	Adj Rsquare	0.102106
Durbin-Watson stat	1.681493		

The regression on Net Buying reveals that based on t-tests, there are that 4 variables does not have significant influence on net buying of foreign portfolio investors. They are Inflation rate, return on T Bill, Return on DJIA, and return on Gold. These 4 variables have a t-statistic with corresponding Prob greater than 0.05. The remaining three variables that had significant influence are exchange rate at 1%, stock market return at 5%, and stockmarket liquidity at 10%. Exchange rate has a negatif coefficient as expected. Stock market return has a positive coefficient as expected while Stock market liquidity has an unexpected negative coefficient. The individual year effects are represented by different intercepts for each years. These intercepts are also reported in the table above.

The three variables that affect foreign investor net buying significantly belong to pull factors. No any push factors affect foreign investor net buying significantly.

### CONCLUSION AND RECOMMENDATION

This study has investigated the influence of pull factors and push factors on foreign portfolio investment entering Indonesia Stock Market. This study use two measures for the magnitude of foreign portfolio investment which are foreign investor total buying and foreign investor net buying. From panel data regression on total buying, this study revealed that only two variables that belong to pull factors affect the foreign portfolio investment. These two variables are exchange rate and stock market liquidity. The negative coefficients of exchange rate and the positive coefficient of stock market liquidity are as expected. The individual year effects are also present represented by the different intercepts for each year. No variables in push factors affect foreign portfolio investment significantly. Meanwhile, from panel data regression on net buying, there are three variables that belong to pull factors that affect the foreign portfolio investment significantly. These variables are exchange rate, stock market return, and stock market liquidity. The coefficients of exchange rate and stock market return are as expected. Nevertheless, the negative coefficient of stock market liquidity are not as expected. The individual year effects are also present represented by the different intercepts for each year. Similar to regressin on total buying, no variables in push factors affect foreign portfolio investment significantly. In general, the foreign portfolio investment in Indonesia is affected by pull factors only.

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