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Exchange Rate Pass Through Viewed from Wholesale Price in Indonesia

SRI ISNOWATI[1], FX SUGIYANTO[2], AKHMAD SYAKIR KURNIA[3] and ENDANG TJAHJANINGSIH[4]

[1] Associate Professor, Faculty of Economics and Business,Stikubank University, Semarang, Indonesia, e-mail: isnowati@edu.unisbank.ac.id
[2] Professor, Faculty of Economics and Business,Diponegoro University, Semarang, Indonesia, e-mail: fxsugiyanto@undip.ac.id
[3] Associate Professor, Faculty of Economics and Business,Diponegoro University,Semarang, Indonesia, e-mail: akhmadkurnia@undip.ac.id
[4] Associate Professor, Faculty of Economics and Business,Stikubank University, Semarang, Indonesia, e-mail: naning@edu.unisbank.ac.id

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ABSTRACT

This paper explores the effect of changes in exchange rates on domestic prices, known as Exchange Rate pass Through. The data used in this study are data on the economy in Indonesia in the period 1997.3 to 2017.4. The analytical tool used is multiple regression with the Error Correction model approach. Based on the results of the analysis conducted shows that the effect of the exchange rate on the wholesale price index in the long run is greater than the short run. This shows that the effect of the exchange rate on domestic prices is indirect.The foreign interest rates variabel effect to wholesale price index in the long term, while the domestic interest rates effect in the short and long term. The effect of foreign prices on the wholesale price index is much larger in the short than in the long-term. Meanwhile, the variable of foreign capital in both the short and long-term, it has a positive and significant effect on the wholesale price index.The effect domestic capital variable is different from the ones on foreign capital because in the short term the domestic capital was not significant to the wholesale price index. The effect of domestic capital on the wholesale price index was positive and significant in the long term.The effect of foreign and domestic capitals in the long term on the wholesale price was positive. It suggests that foreign and domestic capital did not substitute each other, but they were complementary.

INTRODUCTION

The interest of economists studying Exchange Rate Pass Through started in the 1970s (Goldberg and Knetter,1997; Ihrig, et.al,2006). Economists were interested in viewing the relationship between price and exchange rate based on the desire to test the basis of global monetarism; LOP

(Law of One Price) and PPP *(Purchashing Power Parity*). In addition, the studies on ERPT were also to determine the effect of exchange rate changes on external balance (as measured by the balance of payments or current account) and domestic inflation. The studies on *Exchange Rate Pass Through* had been done, but there was no uniformity regarding the definition of "pass through". Most researchers focused on the relationship between the changes in exchange rate to import prices (Campa and Goldberg, 2005; Herzberg et al, 2003; Parsley,2003). The other researchers linked the changes in exchange rate with consumer price index (Bacchetta and Wincoop,2003; Beirne and Bijsterbosch, 2011; Bouakez and Rebei, 2008; Mirdala, 2014; Takhtamanova, 2010). Meanwhile, some researchers focused on the relationship of exchange rate to export prices (Choudhri and Hakura,2012; Vigfusson et al, 2007).

There were many studies on the factors affecting ERPT. The factors that affect ERPT can be grouped into two categories; the factors that affect ERPT from macro and micro sides. The researcher analyzing the factors affecting ERPT of the macro side were Taylor (2000), while the ones reviewing the micro were Campa and Goldberg (2002); Campa and Goldberg (2005). To analyze ERPT,the analytical tool used was single equation. The studies using single equation analysis tool with *Ordinary Least Squared*were conducted by Menon(1996), Campa and Goldberg (2002), and Campa and Goldberg (2005), while the ones using *Error Correction Model* (ECM) were Bouakez and Rebei (2008), Choudhri and Hakura (2012) and Takhtamanova (2010).

Indonesia is currently applying the regime of free floating exchange rate. The exchange rate regime has been in effect since August 1997. The implementation of free floating exchange rate leads to the fluctuation on the prices of imported goods. The changes in the prices of imported goods affect the use of the importedgoods. When there is a depreciation of the Rupiah against foreign currencies (in this study, the US dollar), it makes the prices of imported goods rise. When the pricesof imported goodsincrease, economic agents will replace them with domestic goods. The phenomenon is called expenditure switching. Therefore, this study examined the effect of exchange rate changes on the use of capital in Indonesia, which in turn had the impact on the change in domestic prices in Indonesia.

In contrast to the existing ERPT studies, this study firstly built a theoretical model of Exchange Rate Pass Through. This research did not use the existing models, but it build a model of Exchange Rate Pass Through. The economic actors studied were producers. It was intended to see how the use of inputs in production when there is a change in exchange rates. This study was limited to the use of capital. The exchange rate change had the effect on the price of capital production factor imported by producers. In the case of exchange rate depreciation, it caused an increase in production costs incurred by producers. As a result,the increase in production costs led to a rise in domestic prices.

The aim of this study was to analyze the changes in the exchange rate to domestic prices as measured by the Wholesale Price Index. The measurement of Exchange Rate Pass Through was an Indirect Pass Through because the measurement of inflation was through producer price index.In Direct Pass Through, the measurement of exchange rate changes to domestic prices is measured using import prices. The analytical tool used in this research was Error Correction Model because, by using Error Correction Model, the short-term and long-term impacts of the changes in the variables used in the research to consumer price variables in the Indonesia can be identified,

The results of this study are expected to contribute ideas for controlling inflation in Indonesia, especially with regard to the source of inflation coming from abroad,because at this point the majority of the capital used was the capital that must be imported from abroad which was highly dependent on the changes in exchange rate.

The structure of this paper is as follows: chapter two is the literature review; the third chapter describes the research methodology;the fourth chapter describes the results and discussion; and the fifth chapter is the conclusion.

1. LITERATURE REVIEW

The interest of economists to study Exchange Rate Pass Through (ERPT) intensified along with the change in the exchange rate regime from fixed exchange rate to floating exchange rate.Floating exchange rate period that began around 1973 leads to greater exchange rate volatility. It also leads to the increasing complexity of the expectations of floating exchange rate behavior. When a country adheres to a floating exchange rate, the degree of *pass-through*is higher (Beirne and Martin Bijsterbosch, 2011; Kara and Öğünç, 2005). ERPT studies are growing. In the 1980s, an analysis tool used was regression with the estimation method of OLS (Ordinary Least Square) to raise non-stationary, simultaneous and dynamic adjustment issues.In previous years, they still used simple OLS regression.

In subsequent developments, the ERPT studies are related to industrial characteristics, such as market structure and the nature of competition. With increasingly imperfect market structure,it encouraged the researchers to examine the ERPT in industry. One of the studies that had been conducted was the research of Freenstra (1989). The research showedthat in monopolistic market of foreign sales (foreign markets) the response was the same (symmetrically) between the changes in exchange rates and the value of import tariffs. The further studies were conducted by Goldberg and Knetter (1997) and Menon (1996) which examined the relationship between ERPT and industry characteristics, such as market structure and the nature of competition.

The subsequent research that examined ERPT and market structure was the research conducted by Dornbusch (1985). Dornbusch identified four factors that affected the level of pass-through to prices, i.e.: (i) the level of market integration or segmentation, (ii) the level of product differentiation, (iii) the functional form of demand curve, and (iv) market structure and the level of interaction between suppliers

2. MODEL

To result in the output, the producers need input. To find the relationship between input and output, Cobb Douglas was used which can be denoted as follows:

$$Y_t = A_t K L_t^{(1-\alpha)} \quad (1)$$

Where Y is the level of output,A_t is the level of technology in the period of t, $K_t$is capital in the period of t, and L_t is a production factor of labor. The production function of Cobb Douglas is a production function at a certain period (static). In this study, the input used by the producers was only capital input. In the use of capital production factor, the producers can use domestic and foreign capitals(K^d, K^f). The two types of capital can be mutually substituted. When the price of capital changes, the interest rates (r) changes both domestic (r^d)and foreign interest rates (r^f).

At equilibrium condition, the use of domestic and foreign capitals, can be denoted as follows:

$$MRTS_{K^f K^d} = \frac{(r^f}{r^d} | s) \quad (2)$$

The equation is the equilibrium conditions for producers who are least cost in determining a combination of foreign and domestic capitals (K^f, K^d). In the equation,the factor that determines a combination of domestic with foreign capitals is relative foreign interest rate (r^f) which is relative to domestic interest rate (r^d). However, it is still conditional to another factor of exchange rate (s).

The equation is the equilibrium conditions for producers who are least cost in determining a combination of foreign and domestic capitals (K^f, K^d). The combination of foreign capital with domestic capital as expressed in the equation (2) still shows a static balance. In this case, the in-

vestor's decision is not to consider regarding future expectations, whereas in reality, the investor would consider the expectations about the future. When relative domestic interest rates to foreign domestic interest rates rises, investors will continue to use foreign capital more. Then, the equation (2) in this case is expressed in the form of intertemporal as follows:

$$\left(K^f, K^d\right) = \int_{t=0}^{\infty} e^{-\rho t} u(\pi_t) dt \qquad (3)$$

$$\pi_t | \left(r^f/_{r^d}\right), s_t, \left(P^d/_{Pf}\right) \qquad (4)$$

Where $u(\pi_t)$ is the use of capital inputs in period t, $\pi_t$is the total use of foreign and domestic capitals.
$K_t$is the total of domestic capital (K^d) plus imported capital (K^f) .

$K_t = K^d + K^f$

u(∗) is *instantaneous utility function*, showing the utility of capital in particular time.
$\left(K^f, K^d\right)$is the aggregate capital in the time t
E is natural figure = 2,7128.....
ρ is *discount factor (*Romer, 2012*).*

The equations (3) and (4) are the theoretical frameworks that explain the producer's decision to combine domestic and foreign capitals. Furthermore, in this study, the two equations are empirically tested through a theoretical model as follows:

$$\left(K^f, K^d\right)_t = f\left[\left(r^f/_{r^d}\right)_t, s_t, \left(p^d/_{p^f}\right)_t\right] \qquad (5)$$

Empirically, the change (K^f , K^d) shows the change in *Capital Account*. $\left(r^f/_{r^d}\right)$is the ratio of foreign interest to domestic interest, s_t is the exchange rate, $\left(p^d/_{p^f}\right)$ is the ratio of foreign and domestic prices, , s^f is forward exchange rate.

From the theoretical model, it is then derived into the empirical model as follows. From the equation (5), it is then transferred in the form of logarithms so that it becomes the following equation:

$$k^f - k^d = \beta_0 + \beta_1 r^f - \beta_2 r^d + \beta_3 s_t + \beta_4 p^d - \beta_5 p^f \qquad (6)$$

Where: $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0, \beta_5 > 0, \beta_5 > 0$

$$\beta_4 p^d = \beta_0 + \beta_1 r^f - \beta_2 r^d + \beta_3 s_t - \beta_5 p^f - k^f + k^d \qquad (7)$$

$$p^d = \frac{\beta_0}{\beta_4} + \frac{\beta_1}{\beta_4} r^f - \frac{\beta_2}{\beta_4} r^d + \frac{\beta_3}{\beta_4} s_t - \frac{\beta_5}{\beta_4} p^f - \frac{1}{\beta_4}(k^f - k^d) \qquad (8)$$

$$p^d = \gamma_0 + \gamma_1 r^f - \gamma_2 r^d + \gamma_3 s_t - \gamma_4 p^f - \gamma_5 (k^f - k^d) \qquad (9)$$

Where:

$$\gamma_0 = \frac{\beta_0}{\beta_4}$$

$$\gamma_1 = \frac{\beta_1}{\beta_4}$$

$$\gamma_2 = \frac{\beta_2}{\beta_4}$$

$$\gamma_3 = \frac{\beta_3}{\beta_4}$$

$$\gamma_4 = \frac{\beta_5}{\beta_4}$$

$$\gamma_5 = \frac{1}{\beta_4}$$

Where:

p^d	is domestic price
r^f	is foreign interest rate
r^d	is domestic interest rate
s_t	is the exchange rate of Rupiah to Dollar
p^f	is foreign price
k^d	is domestic capital value index
k^f	is foreign capital value index

2. METHODS

The data used in this research was the secondary data published by the Bank of Indonesia and the International Financial Statistic. The data used was the quarterly data from 1997.3 to 2017.4. The periods selected were the periods after 1997.3 because after the period of August 1997 Indonesia adhered to the regime of floating exchange rate. Based on the derivation of the empirical model as shown in the equation (9), it will transformed in the form of Error Correction Model (ECM).

$$p_t^d = \gamma_0 + \gamma_1 r_t^f - \gamma_2 r_t^d + \gamma_3 s_t + \gamma_4 p_t^f + -\gamma_5 \left(k_t^f - k_t^d\right) \quad (10)$$

From the equation (10), it is further denoted in the form of ECM model of Domowitz and El Badawi as follows:

$$\Delta p_t^d = b_0 + b_1 \Delta r_t^f - b_2 \Delta r_t^d + b_3 \Delta s_t + b_4 \Delta p_t^f - b_5 \left(k_t^f - k_t^d\right) + b_6 r_{t-1}^f - b_7 r_{t-1}^d + b_8 s_{t-1} + b_9 p_{t-1}^f + b_{10} \left(k_{t-1}^f - k_{t-1}^d\right) + b_{11} ECT_{t-1} + \varepsilon_t \quad (11)$$

Where: $ECT_t = r_{t-1}^r - r_{t-1}^d + s_{t-1} + p_{t-1}^f - \left(k_{t-1}^f - k_{t-1}^d\right) - p_{t-1}^d$ (12)

Data Analysis Method:

Unit Root Test. This test was conducted to determine earlier and more definite presence of spuriousregression. The economic data which are not stationary cause spurious regression. Stationary test was conducted using Augmented Dickey-Fuller (ADF). For the detection of ADF, it will be divided into three;the ADF involving constants (C, n), the ADF which involves constant and time trend (T, n), and the ADF which does not involve constant and time trend (N, n). Meanwhile, for the ADF test, it can be defined as follows:

$$ADF(C,n): d(Y) = c\ (Y(-1)\ d\big(Y(-1)\big) d\big(Y(-2)\big) \dots d(Y-n)) \quad (13)$$

$$ADF(T,n): d(Y) = c\ \Big(Y(-1)\ d\big(Y(-1)\big) d\big(Y(-2)\big) \dots d(Y-n)\Big)\ Trend \quad (14)$$

$$ADF(C,n): d(Y) = d\big(Y(-1)\big) d\big(Y(-2)\big) \dots d(Y-n)) \quad (15)$$

Where C is a constant, d is data derivation $Y_t - Y_{t-1}$and (n) $(-n)$ is the operator lag n. the decision-making to determine stationary is by comparing the t test of Y (-1) compared to the critical value of McKinnon (Insukindro,1991).

Integration Degree Test. The integration degree test is conducted when the data is not stationary at the time of stationary test. The detection is intended to find out at which degree the data is stationary. When the data used is not stationary, Granger and Newbold (1974) argue that regression will result in regression with high coefficient of determination (R^2), but with low Durbin Watson statistics. It gives an indication that the resulted regression is a spurious regression. The consequences caused by the spurious regression are: the estimator regression coefficient is not efficient, the forecasting using the regression will be wrong and the common standard detection for the associated regression coefficient associated is invalid. In general, if the data requires differentiation to be stationary, it can be stated as I (d). The test is similar to the unit root test. Thus, to perform these tests, the following autoregressive model along with the OLS need to be estimated:

$$D2X_t = c_0 + c_1 BDX_t + \sum f_1 B^i D2X_t \quad (16)$$

$$D2X_t = g_o + g_1 T + g_2 BX_t + \sum f_i B^i D2X_t \quad (17)$$

Cointegration Test. Cointegration test is a continuation of unit root test and degree of integration. Cointegration testwas intended to test whether the regression residuals resultedis stationary or not (Engle and Granger,1987).To perform cointegration test, first, the researchers neededto observe the behavior of time-series economic data to be used. It means that researchers had to be sure whether the data used were stationary or not. The Detection was conducted using the unit root test and the degree of integration (Insukindro,1992). When one or more variables have different degrees of integration, the variables can not be cointegrated (Engel and Granger,1987). In general, most of the discussion of related issues focused on the variables that integrate 0,I (0) or the degree one I (1). An important characteristic of the degree I (1) is; a variable can be a linear combination when integrated in the degree 0,I (0) (Maddala and Kim,1998). A set of time series variables (X) is said to be cointegrated on the degree d,b or written CI (d,b) when every element X is integrated on the degree of d or I (d) and there is a vector k which is not equal to zero, so that W = k'XI (d,b) with b>0 and k is a vector of cointegration. There were three common tests conducted to test the hypothesis on the presence and absence of cointegration, called CDRW (Cointegrating Regression Durbin Watson),DF (Dickey Fuller) and ADF (Augmanted Dickey Fuller) (Engle and Granger,1987).

CRDW. After conducting a regression to the basic model, the value of Durbin Watson statistics was known. From the figure of DW,it was used to determine the cointegrative nature of the model. If the analyzed model is not stationary, the DW statistics will be close to zero, and reject the null hypothesis of non cointegration. Conversely, if the DW statistic is large, it will accept the alternative hypothesis on the cointegrative nature of the analyzed model. CRDW test is a test model using order one.

DF. The type of this test used the residual figures obtained from the calculation of CRDW, and then having it in a regression at order one.

$$D(RES_t) = -\varphi RES_{t-1} + \varepsilon_t \quad (18)$$

The basis for the decision-making was the statistics t of the coefficientst. φ. If the statistic t is smaller than the statistics of table, it accepts the null hypothesis and it means that there is a non cointegration.

ADF. If the DF works on order one, then the ADF works on a higher order. ADF test model can be written as follows:

$$D(RES_t) = -\varphi RES_{t-1} + \delta_1 D(RES_{t-1}) + .. + \delta_n D(RES_{t-n}) + \varepsilon_t \quad (17)$$

The null hypothesis and another basis for the decision making used in the ADF test is the same as the test of null hypothesis with DF.

3. RESULTS AND DISCUSSION

3.1 Unit Root Test and Degree of Integration

The problems in the time series data is a problem concerning the stationary data. For the stationary testing using Augmented Dickey Fuller, the results of the stationarity analysis with ADF are shown in Table 1.

Table 1. Unit Root Tests

Variable	*Constant*	*Trendand Intercept*	*Without Trend and Intercept*
LPPI	-3,1302***	-3,3334***	3,6177#
Rf	-1,8098#	-3,7619**	-1,7295#
Rd	-1,7040#	-2,3392#	-1,2255#
LS	-4,8086*	-4,7410*	1,2858#
LPF	-0,8070#	-1,3468#	6,6786#
LKF	-3,3794**	-3,3366***	-0,4583#
LKD	-1,3739#	-1,6211#	0,0993#

Remark:
*: stationary at 1%, ** :stationary at 5%, *** : stationary at 10%,
#: non-stationary at 10 %
Source : Processed data

The analysis results of the unit root test are shown in Table 1. The foreign interest rates, domestic interest rate, exchange rates, foreign prices,forward exchange, foreign capital and domestic capital,when specified by calculating the ADF by considering the elements of intercept, trend and intercept,without intercept and trend, shows the elements which are not stationary at each variable at 10%. It is necessary to have the test for the degree of integration on which degree the observed variables is stationary.

Table 2. Degree of Integration Test

Variable	*Constant*	*Trend and Intercept*	*Without Trend and Intercept*
D(LPPI)	-5,4179*	-5,7740*	-4,6108*
D(Rf)	-4,1882*	-4,1617**	-4,1470*
D(Rd)	-6,6585*	-6,6109*	-6,7061*
D(LS)	-6,1984*	-6,1954*	-6,1018*
D(LPf)	-9,0125*	-9,0025*	-2,2151**
D(LKf)	-10,1258*	-10,1105*	-10,1952*
D(LKd)	-7,6090*	-7,8492*	-7,6619*

Remark:
*: stationary at 1%, ** :stationary at 5%, *** : stationary at 10%,
#: non-stationary at 10 %
Source : Processed data

Based on the calculations in Table 2,it shows that the variable of wholesale price index, foreign interest rate, domestic interest rates, exchange rates, foreign prices, forwards exchange, foreign capital and domestic capital are integrated in the degree 1, I (1).

Cointegration Test. After it was found that the variables used in this study had the same degree of integration, which were integrated on the degree of one, the next step was to test the cointegration using the Johansen cointegration test. Based on the data analysis, the value of trace statistics is 332.5032 which is greater than the critical value of 159.5297.Thus, it can be conclud-

ed that the variables of wholesale price index, foreign interest rates, domestic interest rates, exchange rates, foreign prices, forwards exchange, foreign capital and domestic capital were cointegratedin the long term.

Table 3. The Regression Anaysis Results of ERPT Estimates by the Use of ECM

Dependent Variables D(LPPI)

Variable	*Coefficient*	*t statistic*
C	-6,1069*	-4,3450
D(RF)	-0,0143#	-1,0862
D(RD)	0,0042**	2,1076
D(LS)	0,2308*	4,6967
D(LPF)	2,9167*	4,3889
D(LKF)	0,0240**	2,4089
D(LKD)	-0,0083#	-0,4038
RF(-1)	0,6651*	8,1297
RD(-1)	0,6598*	7,9269
LS(-1)	0,8373*	12,3272
LPF(-1)	1,8872*	8,3744
LKF(-1)	0,6669*	8,2163
LKD(-1)	0,6629*	7,8415
ECT	-0,6598*	-7,9913
R^2	0,9960	
F statistik	917,5740	

Remark:
*: stationary at 1%, ** :stationary at 5%, *** : stationary at 10%,
#: non-stationary at 10 %
Source : Processed data

One of the key assumptions built into the OLS was that the variant is homoscedasticity. If this assumption is not met, there will be a problem of heteroscedasticity. In this research, the detection of heteroscedasticity was applied using ARCH. The detection of heteroscedasticity using ARCH led to the conclusion that there is no problem of heteroscedasticity in the model. The probability value of chi square count is 0.3924 greater than α of 0.05.

Meanwhile, for detecting autocorrelation, this study used the Serial Correlation LM test. From the analysis results, it was found that the probability of Obs * R squareis 0.6790 exceeding the level of significance (α) = 5%, so it can be concluded there is no problem of autocorrelation in the model used. The detection of multicollinearity in the variablesof wholesale price index, foreign interest rate, domestic interest rates, exchange rates, foreign prices, forwardsexchange, foreign capital and domestic capital shows that the variables with no multicollinearityare the variables of foreign interest rates, exchange rate, and foreign capital. However, this study did not condut corrective actions, given that multicollinearity occurred in the real conditionin macro economic variables. If the problem of multicollinearity occurs, the estimated parameters still generate the parameters of BLUE (Gujarati, 2004).

The analysis results show that the variable of foreign interest rates (RF) in the short term is not significant to the wholesale price index in Indonesia, but in the long term the variable of foreign interest rates had a positive and significant effect on the wholesale price index in Indonesia. With the regression coefficient of 0.66, it means that if an increase in the variable of foreign interest rates is one percent, the variable of wholesale price index will increase by 0.66 percent. The hypothesis testing results to the variable of foreign interest rates accepted the hypothesis proposed in this study. If foreign interest rates rise, it will lead to increasingly high cost of production factors to be borne by producers. With the increase in production costs, it will lead to a rise in domestic prices so that the domestic prices reflected in the wholesale price index will rise.

Meanwhile, for variable of domestic interest rates (LRD), it had consistently positive and significant effect on the wholesale price index in Indonesia. The positive effect with the meaning of the rise of interest rates will cause an increase in wholesale price index. The transmission occurredwas through production costs. The interest rate is the cost of the capital used by producers. With the increase in the cost borne by producers, it means that it will influence the supply in the form of the decrease of supply. In line with theory of cost push inflation, if there is an increase in production costs,it will the supply and the prices will rise.

The effect of the changes in exchange rate variable (LS) to the variable of wholesale price index (LPPI) in Indonesia was the value of Exchange Rate PassThrough. It was the main focus of this research. The value of.ERPT is 0.2308 in the short term and 0.8373 in the long term. It means that the variable of exchange rates has a positive significant effect on the wholesale price index. When compared to the degree of Exchange Rate Pass Through, it shows that in the long term the degree of pass-through. is high.It also shows that the sensitivity of the exchange rate changes to wholesale price index is high. Based on the hypothesis proposed in this study, it indicates that the results of the study accepted the hypothesis in the research. The result of this research almost the same value as the research conducted by Beirne and Bijsterbosch (2011).

According to the theory of Purchasing Power Parity (PPP), in case of exchange rate appreciation, it causes the price of imported goods cheaper. By lowering the price of imported goods, it caused a decline in wholesale price index. It applied throughout the study period when in Indonesia exchange rate decreased (depreciation). With the depreciation of exchange rate, it caused the price of imported capital more expensive. However, the producers in Indonesia did not lower or reduce their purchases of imported inputs (capital) due to the structure of the existing industries in Indonesia.Most of the capital, both raw and semi-finished materials, (Foreign Direct Investment)used largely imported goods, so the depreciation of the exchange rate did not mean lowering the wholesale price index, instead of raising it. It is in line with a survey conducted by Bank of Indonesia showing that 40% of respondents from the manufacturing sector was concerned about the occurrence of a sharp depreciation of the exchange rate because the portion of the manufacturing companies using imported raw materials is large enough or equal to 35% of the total manufacturing industries. The weakening of the exchange rate will cause a rise in production costs (Surjaningsih and Savitri,2014).

The degree of the pass through of consumer block was much smaller than the degree of the pass through of manufacturer block because the effect of exchange rate changes will directly affect the path of the producers with over imported products. It is often said to be the direct channel of passthrough. It is in line with the research conducted by Bacchetta and Wincoop (2003) which states that the Exchange Rate Pass Through from the side of consumer price is smaller than the ERPT on import prices.

The research results for the variable of foreign price level (LPF) to the wholesale price index (LPPI) in both the short and long term were positive and statistically significant. It means that the increase in foreign will raise the wholesale price. In the short term, the results of the regression coefficient indicates that the effect of foreign prices on the Wholesale Price Index is much larger than the effect in the long-term.

Furthermore, for the variable of foreign capital (LKF) in both the short and long-term, it has a positive and significant effect on the wholesale price index. When foreign capital used in the production process is increasingly large, it causes increased production costs. It is caused by the capital employed to be paid by Rupiah depreciating against the Dollar. Consequently, the Wholesale Price Index increased. The research results differ from the ones conducted in developed countries. In developed countries, it shows that there is a negative association between the openness of capital markets and inflation (Mukherjee,2011).

The research results on domestic capital (LKD) is different from the ones on foreign capital because in the short term the domestic capital was not significant to the wholesale price index. The effect of domestic capital on the wholesale price index was positive and significant in the long term. In the two kinds of capital resources, the effect of foreign and domestic capitals in the long term on the wholesale price was positive. It suggests that foreign and domestic capital did not substitute each other, but they were complementary. Thus, the process of expenditure switching to the use of capital in Indonesia in the long term did not occur in Indonesia. Foreign and domestic capital were complementary. It is in line with the Neo Classical theory which states that foreign capital flows should function as a complement not a substitute for domestic capital from domestic savings and investment gap (Warjiyo and Juhro, 2016).

CONCLUSION

Based on the analyzed before, it conclued that Exchange Rate Pass Through in the long run is bigger than in the short run.The results of the variables influencing the wholesale prices in the short term are the level of domestic interest rates, foreign prices, exchange rates, forward exchange, and foreign capital. Mean while in the long term, the variables that affect the wholesale pricesare foreign prices, exchange rate, forward exchange, foreign and domestic interest rates, and the amount of foreign and domestic capitals.Concerning the use of foreign and domestic capitals, the mechanism of expenditure switching between foreign and domestic capitals only happens in the short term, while in the long term the expenditure switching does not occur. It indicates that in the long term the association between foreign and domestic capitals is complementary.

Implication. The research results show that the effect exchange rate to inflation in Indonesia (as measured by whole price) is positive with the ERPT value of 0.2308 in the short run and 0,8373 in the long run. Then, it can be taken into the consideration for determining the inflation control policy in Indonesia.The direct effect of exchange rate changes on inflation is quite high so that the Bank of Indonesia should pay more attention to the changes in exchange rates in order to maintain the inflation rate in Indonesia.

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