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THE IMPACT OF CHANGES IN WORLD OIL PRICES, INTEREST RATES, AND NET EXPORTS ON THE EXCHANGE RATE OF ASEAN-4 COUNTRIES

Dyah Ayu Palupi[1]
Rudi Purwono[2]

[1,2] Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

This research examines the impact of changes in world oil prices, interest rates, and net exports on exchange rates in four ASEAN countries (Indonesia, Malaysia, Thailand, and the Philippines). The method used is the Panel Vector Error Correction Model (PVECM) over 2000Q1-2020Q4. The variables analyzed include exchange rates, world oil prices, interest rates, and net exports. The research findings indicate that (1) world oil prices affect exchange rates in both the short and long term, with exchange rates appreciating in the initial period and depreciating after the third period due to oil price shocks; (2) interest rates influence both the short and long term, with exchange rates tending to appreciate in response to interest rate shocks; and (3) net exports only affect the exchange rates in the long term, with exchange rates tending to depreciate in response to net export shocks.

Keywords: *Exchange Rates, World Oil Prices, Interest Rates, Net Exports, Panel Vector Error Correction Model (PVECM)*

ABSTRAK

Penelitian ini bertujuan untuk mengkaji pengaruh perubahan harga minyak dunia, suku bunga, dan net ekspor terhadap nilai tukar di negara ASEAN (Indonesia, Malaysia, Thailand, dan Filipina). Metode yang digunakan adalah Panel Vector Error Correction Model (PVECM) periode 2000Q1-2020Q4. Variabel yang dianalisis meliputi nilai tukar, harga minyak dunia, suku bunga, dan net ekspor. Hasil penelitian menunjukkan bahwa (1) harga minyak dunia mempengaruhi nilai tukar dalam jangka pendek maupun panjang, dengan nilai tukar depresiasi setelah periode ketiga akibat shock harga minyak dunia; (2) suku bunga memiliki pengaruh dalam jangka pendek dan panjang, dengan nilai tukar cenderung mengapresiasi sebagai respon terhadap shock suku bunga; dan (3) net ekspor berpengaruh dalam jangka panjang, dengan nilai tukar cenderung depresiasi sebagai respon terhadap shock net ekspor.

Kata Kunci: *Nilai Tukar, Harga Minyak Dunia, Suku Bunga, Net Ekspor, Panel Vector Error Correction Model (PVECM)*

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*Correspondence:
Dyah Ayu Palupi

E-mail: dyah.ayu.palupi-2023@feb.unair.ac.id

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Introduction

Exchange rate stability is important in determining the volume of international trade. This happens because a country will need transactions when conducting international trade to meet its needs for goods and services. More incoming and outgoing investment will create capital flows that directly affect the exchange rate (Ramasamy & Abar, 2015). When capital flows out, demand for foreign exchange increases, so the domestic currency depreciates. On the other hand, the influx of capital inflows leads to increased demand for the domestic currency, which means the domestic currency appreciates. Investors consider the movement of capital flows to minimize risks due to global economic uncertainty (Efremidze et al., 2017). Exchange rate volatility is an important empirical problem in macroeconomics because the exchange rate reflects the competitiveness of the domestic currency in the international market.

In an open economy, a country's monetary policy will continue to adjust to international markets. Fluctuations in global oil prices are one of the factors that affect a country's macroeconomic performance. The recession due to rising oil prices shows the relationship between oil prices and aggregate economic activity (Hamilton, 1983). The increase in oil prices has triggered an increase in input costs so that producers will add costs to the price of goods, harming consumers. Soaring inflation in the economy is a challenge for the growth of the country's economy because it erodes the value of money, thereby reducing the value of savings or investments. Countries that depend on oil imports to meet their inputs need a strong currency for price stability. Currencies that appreciate or depreciate due to oil price fluctuations also vary between countries depending on the level of dependence on the global market.

One of the macroeconomic variables, namely interest rates, also causes changes in exchange rate movements. Speculation about future exchange rates is primarily driven by changes in interest rates (Carlson & Osler, 2000). The exchange rate moves opposite to the interest rate differential; when the exchange rate depreciates, domestic interest rates are lower than foreign interest rates (Devereux & Lane, 2003). In an open economy, domestic interest rates follow world interest rates as a reference. The greater the amount of money in circulation, the more it will pressure domestic interest rates. So, investors seek higher revenues with capital outflows, which depreciate the exchange rate.

A currency that appreciates is considered to have international competitiveness. A country with an appreciated domestic currency will increase the prices of export goods on the international market and reduce the prices of imported goods. In this case, it means that exchange rate volatility in a country has a significant influence on export and import behavior (Wang & Barrett, 2007). Meanwhile, increasing inflation will reduce the currency's value and increase public demand for imported goods, causing a deficit. For developing countries, exports can be hampered due to exchange rate volatility (Chit et al., 2010). High net exports show that a country's exports are higher than imports, which affects national income.

Several previous studies have yielded differing results concerning the influence of shocks in world oil prices, interest rates, and net exports on the exchange rate. Initial findings suggest that a decline in oil prices leads to exchange rate appreciation (Akram, 2004; Narayan, 2013). Oil demand shocks significantly impact exchange rates, causing them to shrink when oil prices rise. The exchange rate decreases when the prices of oil rise. However, later research indicates contrasting outcomes. Baek (2021) finds that rising crude oil prices lead to long-term exchange rate appreciation. A result corroborated by Katircioglu et al. (2015) argues

that the variation in oil prices does not significantly impact exchange rates. The relationship between oil price shifts and broader economic measures hinges on a country's degree of oil dependence, particularly when oil is a key industrial component.

Various studies show mixed results regarding the influence of interest rates on exchange rates. In emerging markets, Salisu et al. (2021) discovered that interest rates and exchange rates correlate, with inflation playing a crucial part in shaping this relationship over the short and long term. When inflation rates are higher, there is an inverse relationship between exchange rates and the difference in interest rates. Hacker et al. (2014) found a positive influence of interest rates on exchange rates, strengthening over time. Golit et al. (2019) observed a short-term negative relationship in Japan, while in the euro area, this negative relationship extends to the long term. In Canada, the correlation between interest rates and exchange rates is positive and persists over both the short and long term, thanks to the adaptability of price levels.

Research on net exports and exchange rates also shows varied results. Thorbecke & Kato (2012) found no mutual influence between exchange rates and exports in Japan, an importer country that re-exports goods. Dincer & Kandil (2011) noted that the growth of importing countries is a key determinant of net exports, with Türkiye's export sector heavily reliant on competitiveness and exchange rate developments. Increased competitiveness enhances export demand sensitivity, leading to higher net exports and exchange rate appreciation. Liew et al. (2003) found that the depreciation of the ASEAN-5 currencies against the Japanese yen improves the trade balance as goods become cheaper for foreign buyers, boosting imports of domestic goods and services, while domestic consumers buy fewer expensive Japanese goods.

Therefore, the exchange rate is a closely observed, analyzed, and manipulated economic measure by governments. Developing countries, being open to foreign trade, cannot shield domestic inflation from external price shocks, such as import price variations. Fluctuations in world oil prices significantly impact a country's macroeconomic performance. ASEAN member countries, as open economies, achieve economic growth through investment and import exports. The World Bank has determined that, due to their per capita income levels, Indonesia, Malaysia, Thailand, and the Philippines are all middle-income nations.

Literature Review

Purchasing Power Parity Theory

According to this theory, the value of two currencies will fluctuate in response to shifts in each nation's respective price levels (Mishkin, 2004). Purchasing power parity is the term used to describe the law of one price that governs international trade. According to this law, a dollar or other currency should have the same purchasing power everywhere if international arbitrage is feasible. The PPP theory predicts the long-term movements of exchange rates. A country's currency will depreciate about the currency of a country with lower inflation if its inflation rate is higher than that of the comparison country (Hubbard & O'Brien, 2018).

Interest Rate Parity Theory

The interest rate parity hypothesis describes how interest rates and exchange rates relate. The interest rate parity hypothesis defines the relationship between interest rates and reference rates and suggests that the exchange rate between two currencies should reflect the pace at which the interest rate differential between them changes. The state of equilibrium

occurs when there is a sufficient difference between the forward and spot rates to balance the interest rate difference between the two countries' currencies.

Mundell-Fleming Theory

The theory describes a small open economy in which the accepted exchange rate system determines total income (Mankiw, 2016). Exchange rates negatively impact net exports. When net exports decline, the currency depreciates because an increase in the exchange rate causes this to happen.

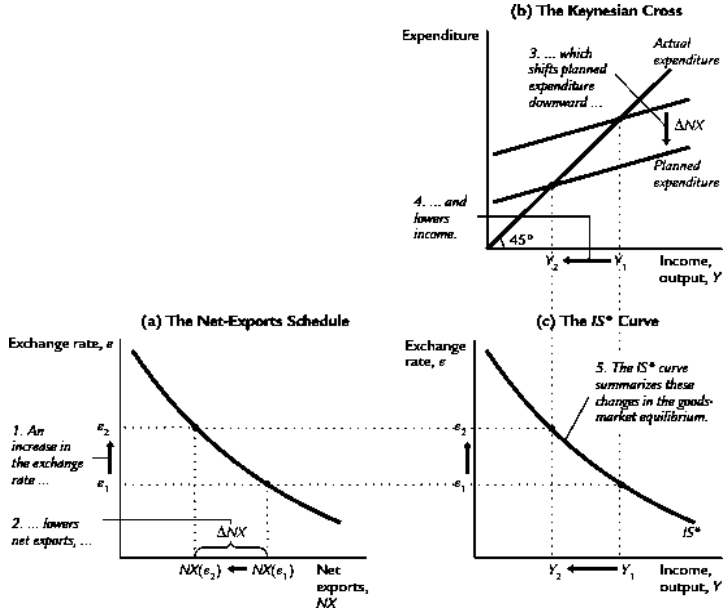

Figure 1: Goods Market and the IS Curve

Source: (Mankiw, 2016)

Exchange rates have a negative impact on net exports. The exchange rate rises when net exports decline, resulting in currency depreciation and vice versa. The interest rate is kept constant using the IS* equation. Because a high exchange rate lowers net exports, which lowers aggregate income, Figure 1 depicts a downward-sloping IS* curve. Here, we derive the IS* curve by combining the Keynesian intercept with the net exports curve. The graph's part (a) illustrates how net exports drop from NX1 to NX2 due to an exchange rate adjustment from e1 to e2.

Previous Research

Kocoglu et al. (2023) observed data from January 1988 to June 2022 using Granger Causality and found a mutual relationship between currency rates and oil prices. Because the ASEAN economy is so susceptible to internal and external shocks, there is a noticeable causal relationship between oil prices and exchange rates in ASEAN countries during important events. These findings demonstrate how important time-varying indicators are for understanding how global oil prices and exchange rates affect investors and policymakers.

EryiĞit (2012) shows that economic variables are more affected by fluctuations in oil prices in countries that import oil than in those that sell it, especially in emerging countries. This study examined the effects of oil price shocks on the stock market, interest rates, exchange rates, and oil prices using weekly data from 2005 to 2008 and the VAR technique. The results showed that oil price shocks benefited the stock market but negatively impacted the interest rates and trade rates.

Malik et al. (2017) showed that an initial decline in the exchange rate occurs due to the impulse reaction to shocks in global oil prices. The trade imbalances brought about by the variations in oil prices have a detrimental effect on Pakistan's economy. Pakistan's economy is heavily reliant on the price of oil globally because it is an oil-importing nation, and this affects the pricing of domestic commodities.

Ahmed & Mazlan (2021) ranging over the period 2002–2017, of the ASEAN countries. Using both the linear autoregressive distributed lag (ARDL investigated the connection between interest rates and exchange rates in the ASEAN nations between 2002 and 2017. They discovered that fluctuations in interest rates have symmetric short-term effects on exchange rates in Singapore, Malaysia, Thailand, Vietnam, and Cambodia. On the other hand, exchange rates in Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam are adversely impacted by long-term fluctuations in interest rates.

Wahyudi et al. (2023) examined factors, particularly interest rates, that affect Indonesian exchange rates. They discovered that interest rates impact exchange rates in the short and long run. Relative interest rates heavily impact exchange rates; higher local interest rates draw more capital to Indonesia, which causes the exchange rate to appreciate.

Asteriou et al. (2016) This study used monthly data from 1995 to 2012 to examine the impact of currency rate volatility on export and import demand for the MINT economies (Turkey, Nigeria, Indonesia, and Mexico). They discovered that whereas long-term exchange rate volatility does not affect export or import demand outside of Turkey, it alters demand for both Mexico and Indonesia.

Ambya & Hamzah (2022) Utilizing panel data from five trading partners (China, Japan, South Korea, India, and Malaysia) from 2015 to 2019, the effect of currency rates on coal exports was examined. According to their analysis, exchange rates significantly negatively impact the amount of coal exported from Indonesia. Export volume rises when the destination country's currency appreciates versus the US dollar. Meanwhile, Indonesian exporters become more competitive overseas by being able to sell their goods at lower prices thanks to the weakening of the rupiah.

Cheng et al. (2016) claimed a favorable correlation between exchange rates and global chain exports with a higher foreign share. The production process benefits from the synergy between foreign and domestic added value. The ultimate product price is determined by the value of all inputs in each country, adjusted for exchange rates.

Hypothesis

Based on previous theories and research, the hypothesis in the study is the answer to the problem that requires truth. The hypothesis in this study is as follows:

Hypothesis 1: World oil price shocks significantly positively affect the exchange rate in the short and long term.

Hypothesis 2: Interest rate shocks significantly negatively affect the exchange rate in the short and long term.

Hypothesis 3: Net export shocks have a significant negative effect on the exchange rate in the short and long term

Methodology

Model Specification

The Vector Error Correction Model combines the long-run relationship between cointegrating variables through the error correction term and the short-run dynamics through the lags of variable changes. This model shows how the variables in the system react to deviations from long-run equilibrium and how they interact in the short run. The following equation is according to Pesaran (2015) :

$$\Delta y_t = -\alpha\beta' y_{t-1} + \sum_{j=0}^{p-1} \tau_t \Delta y_{t-j} + u_t \quad (1)$$

Where Δy_t represents the first change or differentiation of the dependent variable vector at a time, $-\alpha\beta' y_{t-1}$ is the part that represents the error correction term (ECT), which shows the adjustment mechanism towards long-term equilibrium, $\sum_{j=0}^{p-1} \tau_t \Delta y_{t-j}$ shows the short-term component, which represents the short-term dynamics of the model, and u_t is the error term or residual that the model does not explain. It represents stochastic disturbances or random variations in the system. This equation allows you to estimate the dynamic relationship between the variables in your study, both in the long run through the error correction component and in the short run through the lag of changes in the variables.

The Panel Vector Error Correction Model (PVECM) approach is used in this study. The dependent variable's reaction to a shock from the independent variable is ascertained using the PVECM model. Both the short- and long-term effects can be estimated using this strategy. According to Ehikioya et al. (2020):

$$\Delta LER_t = \alpha + \sum_{k=1}^{p} \beta_k \Delta OP_{t-k} + \sum_{k=1}^{p} \delta_k \Delta IR_{t-k} + \sum_{k-1}^{p} \vartheta_k \Delta NEX_{t-k} + + \lambda_1 ECT_{t-1} + \varepsilon_t \quad (2)$$

LER : Natural logarithm of the nominal exchange rate (Domestic Currency /USD)

OP : World oil prices (Domestic Currency/Barrel)

IR : Interest rate (Percent)

NEX : Net exports (Million US Dollars)

α : Constant

$\beta_k, \delta_k, \vartheta_k$: Coefficient

λ_1 : *Speed of adjustment*

ECT_{t-1} : Error Correction Term for long-term models

ε_t : Error term

A quantitative descriptive methodology is used in this study. Panel data covering the years 2000Q1–2020Q4 in ASEAN-4 (Indonesia, Malaysia, Thailand, and the Philippines) is the type of data used. Secondary data from the official websites of the International Financial Statistics and the Energy Information Administration were used in the study. The Panel Vector Error Correction Model (PVECM) approach is used in this study. The nominal exchange rate is the research's dependent variable.

Meanwhile, net exports, interest rates, and the price of crude oil globally are the independent variables. The PVECM model determines the dependent variable's reaction

to shocks from the independent variable. An impulse response function test and variance decomposition test were performed to ascertain the PVECM model's dynamic behavior.

Result and Discussion

The statistical description for each independent and dependent variable includes every ASEAN-4 country's mean, median, maximum and minimum values, and standard deviation. If the standard deviation is less than the average value, the data distribution is said to be near the average value. Table 1 displays a range of values, with certain variables exhibiting standard deviations higher than the mean.

Table 1: Descriptive Statistics

Variable	Mean	Median	Max	Min	Std. Dev
			Indonesia		
LER	4.024207	3.985234	4.175798	3.868699	0.083355
OP	6180.306	5794.506	11931.59	2552.506	2002.520
IR	6.900702	5.869500	17.05700	3.200000	3.119012
NEX	-7604.431	-7766.185	-203.2640	-13307.67	2438.886
			Malaysia		
LER	0.563437	0.579784	0.648195	0.479798	0.046368
OP	2.026070	1.905029	3.845640	0.785646	0.711605
IR	2.896095	2.966500	3.502000	1.743000	0.394342
NEX	-19026.34	-19666.54	-8248.958	-31498.94	6127.914
			Thailand		
LER	1.546131	1.530984	1.656578	1.474248	0.052835
OP	18.27164	15.34665	38.38101	7.575410	7.110918
IR	2.064226	1.738000	4.91000	0.450000	1.001939
NEX	-7976.481	-7640.949	1506.207	-18269.25	4289.091
			Philippines		
LER	1.683102	1.685918	1.750370	1.609014	0.039964
OP	27.98599	26.92728	54.16691	10.05478	10.05750
IR	5.239810	4.642000	14.42000	1.866000	2.557020
NEX	3000.106	2622.578	12246.53	-3932.992	4722.960

Table 2 is the result of the stationarity test using Augmented Dicky Fuller (ADF) and Philips-Perron at level (0) and first difference (1). Table 2 shows that all variables are stationary at the first difference level (1). The results show that the data is integrated and supports the PVECM test.

Table 2: Stationarity Test

Variable	ADF		PP	
	Level (0)	**1st Diff (1)**	**Level (0)**	**1st Diff (1)**
LER	0.8211	0.0000***	0.6384	0.0000***
OP	0.5683	0.0000***	0.1587	0.0000***
IR	0.1242	0.0000***	0.3754	0.0000***
NEX	0.7348	0.0000***	0.1592	0.0000***

Note: *** = significant 1%; ** = significant 5%; * = significant 10%

Table 3 shows that there is lag 4. The selection of the optimum lag is based on the number of lags in the criteria. The optimum lag test criteria in the LR, FPE, and AIC criteria show lag 4 as the optimum lag for estimation.

Table 3: Optimum Lag Test

Lag	Log L	LR	FPE	AIC	SC	HQ
0	-7594.026	NA	4.94e+15	47.48767	47.53477	47.50647
1	-4955.285	5195.022	3.76e+08	31.09553	31.33105*	31.18958
2	-4924.977	58.91010	3.43e+08	31.006611	31.43005	31.17539
3	-4895.557	56.45092	3.16e+08	30.92223	31.53458	31.16675*
4	-4871.329	45.88174*	300e+08*	30.87080*	31.67157	31.19057

The long-term cointegration of the variables is explained in Table 4 by means of the Johansen Cointegration Test. Asterisks in Table 4 indicate that no trace statistical value, at most 1, at most 2, and at most 3, exceeds the critical value. The use of PVECM estimates in this study is supported by the presence of cointegration in Table 4.

Table 4: Cointegration Test Results

Hypothesized No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.284637	310.0132	47.85613	0.0001
At most 1*	0.230470	205.5039	29.79707	0.0001
At most 2*	0.205060	123.7675	15.49471	0.0001
At most 3*	0.153971	52.16704	3.841466	0.0000

The various significance and influences of each variable are displayed in Table 5's estimation results. The t-statistics and t-table are compared to ascertain each variable's importance. H0 is rejected if the t-statistic is greater than the t-table, indicating that the independent variable influences the dependent variable. Long-term readings of the coefficient are inversely related to its sign. According to the PVECM estimation results in Table 5, the OP and IR variables significantly lower LER. Meanwhile, LER benefits from the NEX variable.

Table 5: Long-Term Estimation Results

Variable	Coefficient	Standard Error	t-statistics
LER(-1)	1.000000		
OP(-1)	0.000102	1.3E-05	8.15893***
IR(-1)	0.014550	0.00727	2.00265**
NEX(-1)	-7.20E-06	4.2E-06	-1.70128*
C	0.000175		

Note: Significance level ***=1%, **5%, *10%

According to the short-term estimation results in Table 6, the OP and IR variables significantly positively influence the exchange rate at delays 1, 2, 3, and 4. Meanwhile, NEX has no immediate impact on the currency rate. Table 6's speed modification is visible at ECT value -0.309673. This number indicates how quickly the LER will reach the long-term equilibrium point of -0.309673 per period.

Table 6: Short-Term Estimation Results

Variable	Coefficient	Standard Error	t-statistics
CointEq1	-0.309673	0.07018	-4.41268
D(LER(-1))	-0.292832	0.07839	-3.73579
D(LER(-2))	-0.314785	0.07427	-4.23852
D(LER(-3))	-0.13586	0.06718	-2.01214
D(LER(-4))	-0.133550	0.05498	-2.42899
D(OP(-1))	1.73E-05	6.5E-06	2.67802***
D(OP(-2))	2.50E-05	5.6E-06	4.48143***
D(OP(-3))	1.18E-05	4.5E-06	2.62580***
D(OP(-4))	8.76E-06	3.8E-06	2.31391**
D(IR (-1))	0.016725	0.00306	5.47438***
D(IR (-2))	0.008792	0.00328	2.68273***
D(IR (-3))	0.013188	0.00316	4.17699***
D(IR (-4))	0.008487	0.00255	3.32983***
D(NEX (-1))	-1.26E-06	1.0E-06	-1.20185
D(NEX(-2))	1.13E-06	1.3E-06	0.87041
D(NEX(-3))	1.50E-06	1.3E-06	1.16379
D(NEX(-4))	-6.06E-07	1.0E-06	-0.58822
C	-0.000669	0.00183	-0.36630

Note: Significance level ***=1%, **5%, *10%

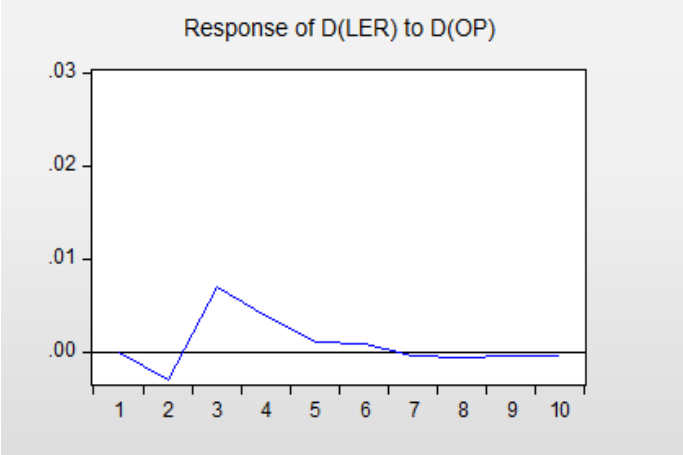

Figure 2: LER response to OP changes

Figure 2 shows the exchange rate response (LER) to changes in world oil prices (OP). In the second period, the OP change responded negatively, namely -0.002930 SD. The third period of changes in oil prices was responded positively by an exchange rate of 0.007035 SD. Impulse response shows that the world oil price shock at the beginning of the period was responded to negatively by the exchange rate. This shows that at the beginning of the period, world oil prices did not affect the price level, which caused the exchange rate to respond negatively to the shock caused by oil prices. Rising oil prices influence governments in many countries to use subsidies. Recent data reveals that government spending on subsidies in Asia is estimated to average 32 billion US dollars by 2020 (International Energy Agency, 2022). Subsidies burden the budget and create fiscal balance problems (Anand et al., 2013). Changes in subsidy levels are associated with changes in international fossil fuel prices. The large influence of subsidies is considered capable of encouraging economic export growth. Husaini et al. (2019) revealed that reducing energy subsidies impacted industrial sector production

and consumption in ASEAN-5 countries (Indonesia, Malaysia, Thailand, the Philippines, and Singapore). So, the value of each change in the subsidy budget has several uncertain impacts on the economic system.

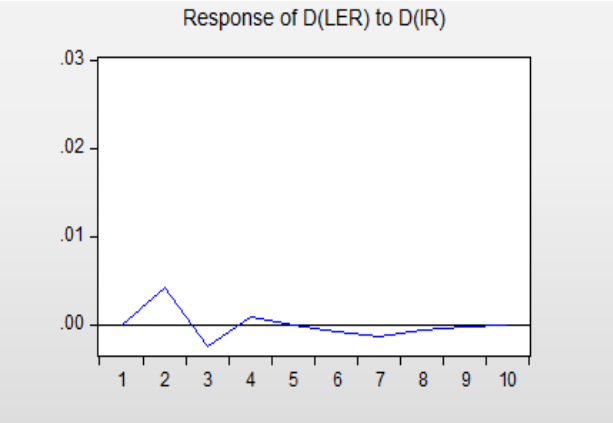

Figure 3: LER response to IR changes

The reaction of the exchange rate (LER) to interest rates (IR) is depicted in Figure 3. The interest rate (IR) responded well in the first period, with an LER of 0.004271 SD. The exchange rate then tends to fluctuate in response to the interest rate shock in the subsequent time, but it usually has a negative trend. Initially, the shock of interest rate increases will cause the exchange rate to rise, which implies it will weaken or devalue. Interest rates are not the only factor that affects exchange rate volatility. According to the research, interest rates have the second-largest impact on currency rates among the ASEAN-4 countries, after global oil prices. Interest rates have less of an impact on currency rates in nations that rely heavily on global oil (Kayhan et al., 2013). The impulse response results indicate that the tendency to increase interest rates will cause the exchange rate to appreciate in all periods of ASEAN-4 countries. Higher domestic interest rates will pressure price levels, resulting in an inflow of capital from investors seeking higher income. However, interest rates need help to maintain the exchange rate as a target to remain stable, especially from external factors such as world oil prices.

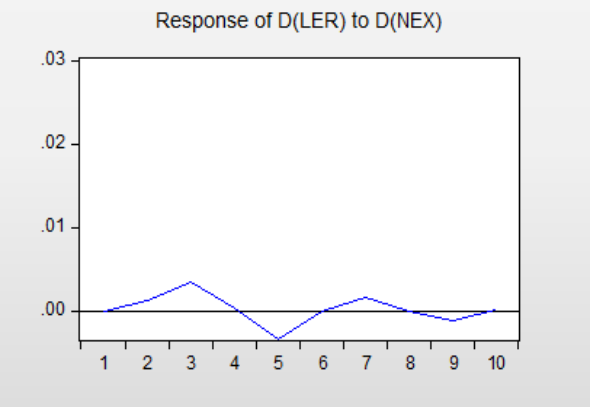

Figure 4: LER response to NEX changes

Figure 4 shows the exchange rate (LER) response to changes in net exports (NEX). In the initial period, the exchange rate positively responded to the shock of net exports of 0.001244 SD. Then, in the fifth period, net exports responded negatively to the exchange rate. Changes in the exchange rate response caused by the net export shock show a value that tends to be positive. Changes in the exchange rate response due to the shock net exports caused show a tendency for the exchange rate to depreciate throughout the period. Tarasenko (2021)

as follows: (I found a correlation between depreciating exchange rates due to increased net exports occurring in trade in imports of fuel, textiles, chemicals, and manufactured goods).

Meanwhile, exchange rate volatility has a negative impact on manufactured goods, machinery, and transportation equipment; namely, when net exports increase, the exchange rate appreciates. In addition, the exchange rate depreciates when there is a surge in exports. Exchange rate volatility precedes spikes in developing countries (Freund & Pierola, 2008). This trade occurs mainly for certain goods with large foreign demand due to limited resources.

The variance decomposition test is used to see how much influence each variable shock has on other variables. This research has independent variables influencing the exchange rate, such as world oil prices, interest rates, and net exports. Table 6 shows the results of the variance decomposition test on exchange rates in ASEAN-4 countries. Based on the results below, the variable that contributes the most to the exchange rate for the following ten periods is the variable itself. Next is the world oil price, with an average of 6.134049. The third is interest rates with a contribution of 2.347, and the last is net exports of 1.796806.

Table 7: Variance Decomposition

Variance Decomposition Of LER					
Period	**S.E.**	**D(LER)**	**D(OP)**	**D(IR)**	**D(NEX)**
1	0.030269	100.0000	0.000000	0.000000	0.000000
2	0.031374	97.11770	0.872198	1.852811	0.157287
3	0.032453	90.82557	5.514664	2.283322	1.376444
4	0.032719	89.52266	6.782832	2.329971	1.364540
5	0.032895	88.56436	6.812823	2.305515	2.317298
6	0.032929	88.43058	6.895071	2.361401	2.312952
7	0.032998	88.06583	6.884399	2.487110	2.562663
8	0.033007	88.01994	6.909990	2.508647	2.561421
9	0.033028	87.91390	6.919201	2.509160	2.657735
10	0.033032	87.89552	6.936490	2.508520	2.659466
Average		90.63560	6.134049	2.347	1.796806

Conclusion

This research aims to examine the immediate and long-term impacts, as well as the exchange rate reactions, to shocks resulting from global oil prices, interest rates, and net exports in the ASEAN-4 nations between 2000Q1 and 2020Q4. The study's conclusions indicate that interest rates and global oil prices have short- and long-term effects on currency rates. Net exports, however, only have a long-term impact. The initial appreciation of the currency rate is followed by a depreciation after the third period due to the shock created by global oil prices. Early on, the interest rate shock leads the exchange rate to devalue and is very volatile, but as interest rates rise, the exchange rate tends to appreciate. The shock that results in a net export surplus typically causes the exchange rate to decline.

This research recommends several policy implications based on the following conclusions. First, the stability of exchange rates should be examined by assessing government subsidy programs as a substitute for preserving people's purchasing power during rising oil costs. However, in the event of exchange rate stability, policies about subsidies may result in a fiscal burden. Second, the central bank must keep controlling capital inflows and outflows

while also using interest rates to preserve the degree of trust in the home currency. Price levels can be suppressed by raising domestic interest rates, which will raise the value of the home currency. In addition, it controls capital outflows in reaction to variations in capital inflows, maintaining the stability of the currency rate. Third, by maximizing the endowment factor, global value chains (GVCs) can be optimized to maximize export sensitivity to fluctuations in exchange rates. Although this study has several limitations, it continues earlier research. This study analyzes changes in exchange rates using only a few variables. It is anticipated that more variables pertaining to aspects that could potentially impact exchange rate fluctuations will be included in future studies.

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