

## Determinants of Foreign Exchange Reserves of Six Countries in Southeast Asia

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**ABSTRACT:** The purpose of this study is to find out and analyze the ratio of Indonesia's foreign exchange reserves to the foreign exchange reserves of other countries in the Southeast Asia region and to find out and analyze how the effect of exchange rates, net exports and economic growth on the foreign exchange reserves of six countries in Southeast Asia. Research results show ratio comparison backup Indonesia's foreign exchange against five ASEAN countries other show that reserve average \_ Indonesia's foreign exchange has ratio highest with Vietnam, namely 4.10 and the lowest with Singapore, which is 0.37. If seen results ratio This show that from six major countries in Asia southeast Indonesia only be in order to four with backup foreign exchange the biggest, above Indonesia there are Singapore, Thailand and Malaysia, while those are under Indonesia only Vietnam and the Philippines. Based on results panel data regression with using Fixed effect model shows that exchange rate influential positive significant and growing economy influential negative significant. Temporary export net No influential significant to backup foreign exchange in six ASEAN countries.

**KEYWORDS:** foreign exchange reserves, Export net, exchange rate, growth economy

### I. INTRODUCTION

Every country seeks to prosper its people by trying to improve people's living standards by meeting all the needs of its people, to fulfill these desires it is necessary to have economic cooperation with other countries because not all people's needs can be met with the income and resources available in that country. One form of economic cooperation with other countries is to carry out international trade through activities selling goods to other countries or exporting and buying goods from other countries or importing. With these export and import activities it is hoped that it can increase the standard of living of the people, especially activities that bring in revenue or income for the State in the form of foreign exchange such as exports and capital inflows through investment so that with more foreign exchange can increase national income and increase foreign exchange reserves that can be used for financial international payments such as import requirements and foreign debt.

The availability of foreign exchange reserves can also be used to control fluctuations in exchange rates or exchange rates with a very important role, so foreign exchange reserves are a very decisive economic variable and are considered very important so that Indonesia and all neighboring countries in the Southeast Asia region also consider foreign exchange reserves to be very important. is important in helping to maintain economic stability, based on ADB (Asia Development Bank) data Singapore has the highest foreign exchange reserves, namely in 2016 amounting to 244.36 billion US Dollars and 2017 amounting to 277.8 billion US Dollars followed by Thailand in 2016 amounting to 164.1 Billion US Dollars and in 2017 amounted to 194.04 billion US Dollars then the new State of Indonesia in 2016 its foreign exchange reserves amounted to 110.9 billion US Dollars and in 2017 amounted to 124.14 Billion US Dollars, followed by Malaysia in 2016 of 91.19 billion US Dollars and in 2017 amounted to 98.9 billion US Dollars, then the Philippines in 2016 amounted to 71.8 billion US Dollars and in 2017 amounted to 71.5 billion US Dollars, finally Vietnam with foreign exchange reserves in 2016 of 36.1 billion US Dollars and in 2017 amounted to 48.6 billion US Dollars.

Foreign exchange reserves are a country's assets in the form of foreign currency obtained from trade and economic cooperation with other countries, these foreign exchange reserves are very important because they can be used as a means of international payment for both import needs or payment of foreign debt and in controlling exchange rates or exchange rates. Theoretically, the domestic currency against the United States Dollar increases the amount of income through exports and foreign

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investment, the more foreign exchange reserves increase. On the other hand, the more imports and debts, the less foreign exchange reserves.

### II. LITERATURE REVIEW

The purpose of international trade is for welfare and one of the indicators is to obtain income in the form of foreign currency or foreign exchange, before the advent of international trade in the 16th and 17th centuries the concept had emerged, especially in the classical era of Adam Smith (1776) with his theory of absolute advantage in international economics books Nopirin (1999) and Haryadi (2007) This theory was pioneered by the classical economist adam smith with the theory of absolute advantage or absolute advantage, Smith's basic premise encourages countries to specialize in producing goods that have absolute advantage. This theory is based more on the magnitude of the real non-monetary variable in the sense that in this theory an item is measured by the amount of labor allocated in producing goods.

Adam Smith's classical theory raises the concept of efficiency in the allocation of labor use so that a country that is more efficient in the use of labor inputs has lower production costs so that the price of goods is lower, thus the country has an absolute advantage, but this theory has many weaknesses, including if absolute advantage is only owned by one country, so international trade will not appear so that comparative theory or comparative theory pioneered by David Ricardo and JSMill appears, and continues in the modern economic era with the famous theory of the Hecksher and Ohlin (HO) model which has a more advanced concept. Complete using the two main factors of production namely Labor and Capital. Foreign exchange is the country's income in the form of foreign currency, in this case it is a foreign currency whose value is high and relatively stable and is a means of international payment. gain from foreign trade, namely exports and capital flows coming from abroad or capital inflow originating from foreign investment either directly Foreign Direct Investment or indirectly in the form of a portfolio, foreign exchange will also decrease if there is more and more need for imports and debt repayments abroad as well as outflow of capital or capita outflow, the needs of Indonesian people who go abroad for tours or other transactions. Osei (2018) in his research Dynamics Foreign exchange reserves accumulation and macroeconomic stability the results obtained from the analysis show that the dynamics of Ghana's foreign exchange reserves has a statistically significant effect only on the exchange rate (GHS / USD) among all macroeconomic variables. The paper concludes that continued accumulation of foreign exchange reserves by the Central Bank of Ghana will lead to a depreciation of the Ghanaian cedi, increase export sector revenues and profits and increase investment and economic growth based on higher exports. Ghana's foreign exchange reserves, through channels preventing the appreciation of the Ghana Cedi, will reduce the risk premium for foreign investment and, in conclusion, help attract a higher share of foreign investment. Shylajan and Duta (2017) found that in the long term, variables such as inflation and short-term foreign debt / GDP affect foreign exchange reserves. A one percent increase in inflation reduces foreign exchange reserves by 0.12% while a one percent increase in short-term foreign debt / GDP increases foreign exchange reserves by 0.46%. On the other hand, in the short term, the exchange rate has a positive effect on India's foreign exchange reserves. Uli.LB (2016) with his research entitled 'analysis of Indonesian foreign exchange reserves' in the Sinta 2 University of Jambi accredited perspective and regional financing journal, shows that there is a two-way relationship between foreign exchange reserves and exchange rates and imports. Sayoga and Tan in the Journal of Economics Paradigm accredited by Sinta 4 show the result is that foreign debt and exports have a significant positive effect on Indonesia's foreign exchange reserves while the exchange rate has a significant negative effectElly Rahmayanti (2014) Syiah Kuala University with the research title "Analysis of Indonesia's foreign exchange reserves" found foreign debt and FDI to have a significant positive effect on foreign exchange reserves and net exports to have a significant negative effect, Muhammad Ihsan (2018) Islamic University of Indonesia with the research title "analysis of Indonesia's foreign exchange reserves 1994-2015" found that in the short term imports had a positive effect on foreign exchange reserves, while the CPI, exchange rate and money supply had no effect and in the long term only imports and CPI which has a positive effect while the exchange rate and money supply have no effect. Binti Khoirul Mahmudah (2019) with the title "The effect of import exports on Indonesia's foreign exchange reserves in the Scientific Journal of Accounting and Finance found that imports have a negative effect while exports have a positive effect on foreign exchange reserves.

### III. RESEARCH METHOD

To answer the problems in this study used 2 (two) methods, namely:

#### A. Descriptive Analysis

Used to analyze the ratio of foreign exchange reserves in Indonesia and other countries in Southeast Asia, namely:

$$RCDi = CDi/CD \times 100\%$$

$$RCDi = \text{Indonesia's foreign exchange reserve ratio}$$

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CD = Indonesia's total foreign exchange reserves

CD<sub>x</sub> = foreign exchange reserves of country X in Southeast Asia used as comparison

### B. Quantitative Analysis

To answer the second problem, namely analyzing the influence , exchange rate , debt abroad , export net and growth economy on foreign exchange reserves a multiple regression equation model for panel data is created as follows:

$$CD_{it} = \beta_0 + \beta_1 K_{it} + \beta_2 PE_{it} + \beta_3 XN_{it} + \varepsilon$$

Where:

CD = Foreign Exchange Reserves

K = Course

PE = Economic growth

XN = Net exports

i = Cross section (6 main Asean countries)

t = 2013 to 2018

$\beta_0$  = Constant

$\beta_1, 2, 3, 4$  = Regression Coefficient of Independent Variable

$\varepsilon$  = Error term

## IV. RESULTS AND DISCUSSION

### A. Condition export net , exchange rate, growth economy and foreign exchange reserves six countries in Asean

Variables used \_ in study This is backup foreign exchange , growth economy . For know state of the data during period study ie 2000 to \_ in 2021 got broken down per country as following :

#### a. Indonesian

For know Condition export net , exchange rate, growth economy and foreign exchange reserves in Indonesia seen in the table following this :

**Table 1. Condition export net , exchange rate, growth economy and foreign exchange reserves in Indonesia**

Year	Export net (Million USD)	Exchange rate (Rp/USD)	Exchange Rate (Dollar/Rp)	Foreign Exchange Reserves (Million USD)	Economic Growth (%)
2000	28,609	8,422	0.00012	28,280	4.9
2001	25,359	10,261	0.00010	27,048	3.6
2002	25,870	9,311	0.00011	30,754	4.5
2003	28,508	8,577	0.00012	34,742	4.8
2004	25,060	8,939	0.00011	34,724	5.0
2005	27,959	9,705	0.00010	32,926	5.7
2006	39,733	9.159	0.00011	40,866	5.5
2007	39,628	9.141	0.00011	54,737	6.3
2008	7,823	9,699	0.00010	49,339	6.0
2009	19,681	10,390	0.00010	60,572	4.6
2010	22.116	9,090	0.00011	89,970	6.2
2011	26,061	8,770	0.00011	103,611	6.2
2012	-1,669	9,387	0.00011	105,907	6.0
2013	-4,077	10,461	0.00010	93,427	5.6
2014	-2,199	11,865	0.00008	106073	5.0
2015	7,672	13,389	0.00007	100,626	4.9
2016	9,481	13.308	0.00008	110,931	5.0
2017	11,843	13,381	0.00007	124,143	5.1
2018	-8,699	14,237	0.00007	114,776	5.2
2019	-3,593	14.148	0.00007	122,707	5.0
2020	21,623	14,582	0.00007	128,398	-2.1
2021	35,333	14,308	0.00007	131,405	3.7
<b>Average</b>	<b>17.369.12</b>	<b>1093324</b>	<b>0.00009</b>	<b>78.452.88</b>	<b>4.85</b>

Source: ADB

Based on the above data in Indonesia it can be seen during period study all variable experience fluctuations , exports Indonesia's net average is 17,369.12 million USD with mark export net highest occurred in 2006 amounting to 39,733 million USD

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and the lowest occurred in 2018 namely -8.699 Million USD. For mark swap or the average rupiah exchange rate is 10,933.24 Rupiah per USD or 0.00009 Dollars per Rupiah. Exchange rate experienced mark highest occurred in 2000 , namely 8,422 rupiah per USD or 1 same rupiah with 0.00012 dollars america . Lowest rate occurred in 2020 , namely 14,582 rupiah per USD or 0.00007 dollars per rupiah.

Foreign exchange reserves also fluctuate during period the average research is 78,452.88 Million USD with value of foreign exchange reserves highest occurred in 2021 of 131,405 Million USD and the lowest occurred in 2001 , namely 27,048 million USD. Temporary growth Indonesian economy during period research average 4.85 % with growth highest occurred in 2007 at 6.3 % and the lowest was in 2020 at -2.1 % This happened at the time pandemic Covid19 outbreak in the world including in Indonesia.

### b. Singapore

For know Condition export net , exchange rate, growth economy and foreign exchange reserves in Singapore seen in the table following this :

**Table 2. Condition export net , exchange rate, growth economy and foreign exchange reserves in Singapore**

Year	Export Net (Million USD)	Exchange Rate (USD/SD, RP, RM, Etc)	Unit Rate Dollar	Foreign Exchange Reserves (Million USD)	Economic Growth (%)
2000	3.277.91	1.72	0.58	79,514	9.03
2001	5.767.70	1.79	0.55	74,943	-1.07
2002	8.962.01	1.79	0.55	81,355	3.92
2003	24.725.95	1.74	0.57	95,263	4.54
2004	25.202.51	1.69	0.59	111,634	9.93
2005	29,662.23	1.66	0.60	115,501	7.36
2006	33,490.25	1.58	0.62	135,602	9.00
2007	36,946.96	1.50	0.66	162,306	9.02
2008	17,948.81	1.41	0.70	173,437	1.86
2009	23.754.94	1.45	0.68	185,793	0.12
2010	39,884.54	1.36	0.73	223,678	14.51
2011	43.714.01	1.25	0.79	235,362	6.21
2012	29,739.15	1.24	0.80	256,841	4.43
2013	31.915.93	1.25	0.79	270,484	4.81
2014	37,476.68	1.26	0.78	254,562	3.93
2015	49,761.60	1.37	0.72	245,721	2.97
2016	46.040.45	1.38	0.72	244,366	3.56
2017	4554865	1.38	0.72	277,813	4.66
2018	41.124.95	1.34	0.74	285,349	3.66
2019	31.375.94	1.36	0.73	276,969	1.09
2020	45.064.30	1.37	0.72	359,343	-4.14
2021	50,762.93	1.34	0.74	408,267	7.61
<b>Average</b>	<b>31.915.84</b>	<b>1.46</b>	<b>0.69</b>	<b>207.004.63</b>	<b>4.86</b>

Source: ADB

Based on the above data in Singapore it can be seen during period study all variable experience fluctuations , exports net Singapore averages 31,915.84 Million USD with mark export net highest occurred in 2021 of 50,762.93 Million USD and the lowest occurred in 2000 , namely 3,277.91 million USD. For mark swap or the average SGD/USD exchange rate is 1.46 Singapore Dollars per USD or 0.69 Dollars per dollar singapore . Exchange rate experienced mark highest occurred in 2012 , namely 1.24 SGD per USD or 1 SGD the same at 0.80 dollars america . And the lowest exchange rate occurred in 2001 and 2002 , namely 1.79 SGD per USD or 0.55 USD per SGD.

Foreign exchange reserves also fluctuate during period research average 207,004.63 Million USD with value of foreign exchange reserves highest occurred in 2021 of 408.267 Million USD and the lowest occurred in 2001 , namely 74,943 million USD. Temporary growth economy singapore during period research average 4.86 % with growth highest occurred in 2010 at 14.51 % and the lowest in 2020 was -4.14 % This happened at the time pandemic Covid19 outbreak in the world including in Singapore.

### c. Malaysian

For know Condition export net , exchange rate, growth economy and foreign exchange reserves in Malaysia seen in the table following this :

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**Table 3. Condition export net , exchange rate, growth economy and foreign exchange reserves in Malaysia**

Year	Export net (Million USD)	Rate (RM)	Exchange Rate (Dollar)	Foreign Exchange Reserves (Million USD)	Economic Growth (%)
2000	16.266.17	3.8	0.26	27,432	8.9
2001	14.224.92	3.8	0.26	28,633	0.5
2002	14.299.88	3.8	0.26	32,419	5.4
2003	21.406.84	3.8	0.26	42,772	5.8
2004	21.479.21	3.8	0.26	64,906	6.8
2005	27.293.46	3.78	0.26	69,377	5.3
2006	30.287.52	3.66	0.27	81,724	5.6
2007	29.759.39	3.43	0.29	100,635	6.3
2008	42,930.56	3.33	0.29	90605	4.8
2009	33,436.77	3.52	0.28	92,865	-1.5
2010	34.148.19	3.22	0.31	102.325	7.4
2011	4059983	3.06	0.32	128,964	5.3
2012	31.068.46	3.08	0.32	134,940	5.5
2013	22,627.60	3.15	0.31	130,492	4.7
2014	25.201.12	3.27	0.30	111,765	6.0
2015	23.448.12	3.90	0.25	91,429	5.1
2016	21.248.57	4.14	0.24	91,194	4.4
2017	22.905.70	4.30	0.23	98,938	5.8
2018	30,676.29	4.03	0.24	97,788	4.8
2019	35.162.86	4.14	0.24	99,467	4.4
2020	43.617.51	4.20	0.23	102,642	-5.6
2021	6095570	4.14	0.24	107,184	3.1
<b>Average</b>	<b>29.229.30</b>	<b>3.70</b>	<b>0.27</b>	<b>8765889</b>	<b>4.49</b>

Source: ADB

Based on the above data in Malaysia it can be seen during period study all variable experience fluctuations , exports Malaysia's net average is 29,229.30 Million USD with mark export net highest occurred in 2021 of 60,955.70 Million USD and the lowest occurred in 2001 , namely 14,224.92 million USD. For mark swap or the average RM/USD exchange rate is 3.70 Malaysian Ringgit per USD or 0.27 Dollars per Malaysian Ringgit . Exchange rate experienced mark highest occurred in 2011 , namely 3.06 RM per USD or 1 RM the same at 0.32 dollars america . And rates Lowest occurred in 2017 , namely 4.30 RM per USD or 0.23 USD per RM.

Foreign exchange reserves also fluctuate during period the average research is 87,658.89 Million USD with value of foreign exchange reserves highest occurred in 2012 amounting to 134,940 million USD and the lowest occurred in 2000 , namely 27,432 million USD. Temporary growth economy singapore during period research average 4.49 % with growth highest occurred in 2000 at 8.9 % and the lowest in 2020 was -5.6 % This happened at the time pandemic Covid19 outbreak in the world including in Malaysia.

### d. Thai

For know Condition export net , exchange rate, growth economy and foreign exchange reserves in Thailand seen in the table following this :

**Table 4. Condition export net , exchange rate, growth economy and foreign exchange reserves in Thailand**

Year	Export net (Million USD)	Exchange Rate (Baht)	Exchange Rate (Dollar)	Foreign Exchange Reserves (Million USD)	Economic Growth (%)
2000	11.60	40.11	0.024	31,933	4.45
2001	8.39	44.43	0.022	32,350	3.44
2002	9.14	42.96	0.023	38,042	6.14
2003	11.17	41.48	0.024	40,965	7.18
2004	10.75	40.22	0.0248	48,498	6.28
2005	3.53	40.22	0.024	50,502	4.18
2006	13.57	37.88	0.026	65,147	4.96
2007	26.55	34.51	0.028	85110	5.43
2008	17.27	33.31	0.030	108,317	1.72

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2009	31.28	34.28	0.029	133,599	-0.69
2010	26.52	31.68	0.031	165,656	7.51
2011	12.08	30.49	0.032	165,200	0.84
2012	0.077	31.08	0.032	171,106	7.24
2013	0.43	30.72	0.032	159,022	2.68
2014	17.22	32.47	0.030	149,064	0.98
2015	26.31	34.24	0.029	149,291	3.13
2016	35.76	35.29	0.028	164,148	3.43
2017	32.55	33.93	0.029	194,048	4.17
2018	10:29 p.m	32.31	0.030	197,031	4.22
2019	26.63	31.04	0.032	214,573	2.15
2020	40.94	31.29	0.031	246,034	-6.19
2021	39.91	31.97	0.031	224,804	1.56
<b>Average</b>	<b>19.27</b>	<b>35.27</b>	<b>0.028</b>	<b>128.838.18</b>	<b>3.40</b>

Source: ADB

Based on the above data in Thailand it can be seen during period study all variable experience fluctuations , exports Thailand's net average is 19.27 Million USD with mark export net highest occurred in 2020 of 40.94 Million USD and the lowest occurred in 2012 , namely 0.077 million USD. For mark swap or the average Baht/USD exchange rate is 35.27 Thai Baht per USD or 0.028 Dollars per Thai Baht. Exchange rate experienced mark highest occurred in 2011 , namely 30.49 Baht per USD or 1 Baht the same with 0.032 dollars america . And rates Lowest occurred in 2001 , namely 44.43 baht per USD or 0.022 USD per Baht.

foreign exchange reserves also fluctuate during period the average research is 128,838.18 Million USD with value of foreign exchange reserves highest occurred in 2020 of 246,034 Million USD and the lowest occurred in 2000 , namely 31,933 million USD. Temporary growth the Thai economy during period research average 3.40 % with growth highest occurred in 2010 at 7.51 % and the lowest in 2020 was -6.19 % This happened at the time pandemic Covid19 outbreak in the world including in Thailand.

### e. Vietnamese

For know Condition export net , exchange rate, growth economy and foreign exchange reserves in Vietnam seen in the table following this :

**Table 5. Condition export net , exchange rate, growth economy and foreign exchange reserves in Vietnam.**

Year	Export net (Million USD)	Exchange (Dong)	Rate	Exchange Rate (Dollar)	Foreign Reserves (Million USD)	Exchange	Economic Growth (%)
2000	-1.153.8	14.167.75		0.00007	3,416		6.78
2001	-1.188.7	14.725.16		0.00007	3,660		6.89
2002	-3,039.5	15.279.5		0.00007	4,121		7.08
2003	-5.106.5	15.509.58		0.00006	6,222		7.34
2004	-5,483.8	15,746		0.00006	7,041		7.78
2005	-4,314	1585891		0.00006	9050		7.54
2006	-5.064.9	15,994.25		0.00006	13,382		6.97
2007	-14.203.3	16.105.12		0.00006	23,472		7.12
2008	-18.028.7	16.302.25		0.00006	23,882		5.66
2009	-12,852.5	17.065.08		0.00006	16027		5.39
2010	-12.601.9	18.612.91		0.00005	12054		6.42
2011	-9.844.1	2050975		0.00005	13.128		6.24
2012	748.8	20,828		0.00005	25.161		5.24
2013	0.3	2093341		0.00005	25,481		5.42
2014	2,368	21.148		0.00005	33,801		5.98
2015	-3,759.2	21,697.56		0.00005	27,879		6.67
2016	1.602.4	21.935.00		0.00005	36,167		6.21
2017	1.903.3	22.370.08		0.00004	48,693		6.81
2018	6.455.2	22.602.05		0.00004	55,074		7.07
2019	10.570.71	23.050.24		0.00004	77,955		7.01
2020	1993825	23.208.36		0.00004	94,436		2.90
2021	4.075.71	23.159.78		0.00004	107,437		2.58



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<b>Average</b>	<b>-2.226.28</b>	<b>18,945,85</b>	<b>0.00005</b>	<b>30,342,67</b>	<b>6.23</b>
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Source: ADB

Based on the data above in Vietnam it can be seen during period study all variable experience fluctuations , exports net Vietnam averages -2,226.28 Million USD with mark export net highest occurred in 2020 of 19,938.25 Million USD and the lowest occurred in 2008 namely -18,028.7 Million USD. For mark swap or the average Dong/USD exchange rate is 18,945.85 Dong per USD or 0.00005 Dollars per Vietnamese Dong. Exchange rate experienced mark highest occurred in 2000 , namely 14,167.75 Dong per USD or 1 Dong the same with 0.00007 dollars america . And rates Lowest occurred in 2020 , namely 23,208.36 Dong per USD or 0.00004 USD per Dong.

foreign exchange reserves also fluctuate during period the average research is 30,342.67 Million USD with value of foreign exchange reserves highest occurred in 2020 of 107,437 Million USD and the lowest occurred in 2000 , namely 3,416 million USD. Temporary growth Vietnam's economy during period research average 6.23 % with growth highest occurred in 2004 at 7.78% and the lowest was in 2021 at 2.58 %.

### f. *Philippines*

For know Condition export net , exchange rate, growth economy and foreign exchange reserves in the Philippines seen in the table following this :

**Table 6. Condition export net , exchange rate, growth economy and foreign exchange reserves in the Philippines.**

<b>Year</b>	<b>Export Net (Million USD)</b>	<b>Exchange Rate (Pesos)</b>	<b>Exchange Rate (Dollar)</b>	<b>Foreign Exchange Reserves (Million USD)</b>	<b>Economic Growth (%)</b>
2000	3587.37	44.19	0.022	12974.8	4.38
2001	-906.95	50.99	0.019	13.352.71	3.04
2002	-4028.35	51.60	0.019	13.200.46	3.71
2003	-4239.30	54.20	0.018	13.523.29	5.08
2004	-4358.69	56.03	0.017	12,979.5	6.56
2005	-6163.49	55.08	0.018	15.800.1	4.94
2006	-4363.68	51.31	0.019	19,891.39	5.31
2007	-5047.74	46.14	0.021	3007143	6.51
2008	-7668.06	44.32	0.022	33.047.23	4.34
2009	-4655.53	47.67	0.020	3750421	1.44
2010	-3435.40	45.10	0.022	53,991.32	7.33
2011	-12190.91	43.31	0.023	65,699.7	3.85
2012	-10029.13	42.22	0.023	7165557	6.89
2013	-5712.70	42.44	0.023	73,791.82	6.75
2014	-3296.36	44.39	0.022	70.260.25	6.34
2015	-12239.99	45.50	0.021	72.352.38	6.34
2016	-26701.92	47.49	0.021	71.853.10	7.14
2017	-27380.33	50.40	0.019	71597.88	6.93
2018	-43533.42	52.66	0.018	69,382,36	6.34
2019	-40666.09	51.79	0.019	78.051.30	6.11
2020	-24597.02	49.62	0.020	96.466.13	-9.51
2021	-43226	49.25	0.020	9472111	5.70
<b>Average</b>	<b>-13220.62</b>	<b>48.44</b>	<b>0.020</b>	<b>49.644.0</b>	<b>4.80</b>

Source: ADB

Based on the data above in the Philippines seen during period study all variable experience fluctuations , exports net Philippines average -13,220.62 Million USD with mark export net highest occurred in 2000 amounting to 3,587.37 million USD and the lowest occurred in 2018 namely -43,533.42 Million USD. For mark swap or the average Peso/USD exchange rate is 48.44 Pesos per USD or 0.020 Dollars per Philippine Peso. Exchange rate experienced mark highest occurred in 2012 , namely 42.22 Pesos per USD or 1 Peso the same with 0.023 dollars america . And rates Lowest occurred in 2004 , namely 56.03 Pesos per USD or 0.017 USD per Peso.

foreign exchange reserves have also fluctuated during period research average 49.644 Million USD with value of foreign exchange reserves highest occurred in 2020 of 96,466.13 Million USD and the lowest occurred in 2000 , namely 12,974.8 million

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USD. Temporary growth the Philippine economy during period research average 4.8 % with growth highest occurred in 2016 of 7.14% and the lowest in 2020 was -9.51 % .

### B. The Ratio of Indonesia's Foreign Exchange Reserves to Five ASEAN Countries

For know How comparison or ratio backup Indonesia's foreign exchange against five ASEAN countries other can seen in the table following this :

**Table 7. Ratio of Indonesia's Foreign Exchange Reserves to Malaysia, Singapore, Thailand, Vietnam and the Philippines**

Year	Mrs/Sn	Ina/Mal	Chinese/Thai	Ina/Vie	Ina/Phi
2000	0.35	1.03	0.88	8.27	2.17
2001	0.36	0.94	0.83	7.39	2.02
2002	0.37	0.94	0.80	7.46	2.32
2003	0.36	0.81	0.84	5.58	2.56
2004	0.31	0.53	0.71	4.93	2.67
2005	0.28	0.47	0.65	3.63	2.08
2006	0.30	0.50	0.62	3.05	2.05
2007	0.33	0.54	0.64	2.33	1.82
2008	0.28	0.54	0.45	2.06	1.49
2009	0.32	0.65	0.45	3.77	1.61
2010	0.40	0.87	0.54	7.46	1.66
2011	0.44	0.80	0.62	7.89	1.57
2012	0.41	0.78	0.61	4.20	1.47
2013	0.34	0.71	0.58	3.66	1.26
2014	0.41	0.94	0.71	3.13	1.50
2015	0.40	1.10	0.67	3.60	1.39
2016	0.45	1.21	0.67	3.06	1.54
2017	0.44	1.25	0.63	2.54	1.73
2018	0.40	1.17	0.58	2.08	1.65
2019	0.44	1.23	0.57	1.57	1.57
2020	0.35	1.25	0.52	1.35	1.33
2021	0.32	1.22	0.58	1.22	1.38
<b>Average</b>	<b>0.37</b>	<b>0.88</b>	<b>0.64</b>	<b>4.10</b>	<b>1.77</b>

**Source:** Data processed from ADB

Based on the data in table 5.7. on seen that If compared to with the five ASEAN countries namely Malaysia, Singapore, Thailand, Vietnam and the Philippines on average Indonesia's foreign exchange reserves have ratio highest with Vietnam , namely 4.10 and the lowest with Singapore , which is 0.37. If seen results ratio This show that from six major countries in Asia southeast Indonesia only be in order to four with backup foreign exchange the biggest , above Indonesia there are Singapore, Thailand and Malaysia, while those are under Indonesia only Vietnam and the Philippines.

This data show that Indonesia should Keep going make an effort increase productivity and creativity in various field especially trading international and sector tour as well as climate conducive investment that can \_ bhelp bring foreign exchange. As well as improve amount power work that has competence and resources Power superior human \_ so that can bring more foreign exchange big. in asia southeast it turns out Indonesian still left behind If compared to with Singapore , Thailand and Malaysia in obtain backup foreign exchange.

### C. Influence Export net , Exchange Rates and Economic Growth Against Foreign Exchange Reserves in Six ASEAN Countries

#### a. Regression Results

For get results best panel data regression especially formerly done testing as following:

#### 1. Chou test results

Chou's test was used For comparing the Common effect model with the Fixed effect model. For know chou test results can see in the table following :



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**Table 8. Chou test results**

Redundant Fixed Effects Tests			
Pool: POOL			
Test cross-section fixed effects			
Effect Test	Statistics	df	Prob.
Cross-section F	20.837369	(5,120)	0.0000
Chi-square cross-sections	80.623465	5	0.0000

Source: Eviews 9.0

Based on chou test results are visible mark probability approach zero or small of alpha five percent , so concluded the best model is Fixed effect model if compared to the common effect model.

### 2. Hausman test results

Hausman's test was used For comparing the Fixed effect model with the Random effect model. For know Hausman test results can seen in the table following:

**Table 9. Hausman Test Results**

Correlated Random Effects - Hausman Test			
Pool: POOL			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
Random cross-sections	39.242834	3	0.0000

Source: Eviews 9.0

Based on Hausman test results are visible mark probability approach zero or small of alpha five percent , so concluded the best model is Fixed effect model if compared to Random effect models. With thereby No need Again continue with the next test with the LM test due to the Hausman test still shows the best Fixed effect model.

### 2. Fixed Effect Model Regression Results

For know results Fixed Effect Model regression can seen in the table following this:

**Table 10. Fixed effect regression results of the influence model Export net , Exchange Rate and Growth economy to backup foreign exchange in six ASEAN countries**

Variables	coefficient	std. Error	t-Statistics	Prob.
C	-37.63362	19.09224	-1.971147	0.0510
EN?	0.029711	0.035728	0.831604	0.4073
EXCHANGE RATE?	896.2094	102.4905	8.744320	0.0000
PE?	-4.311615	1.234769	-3.491840	0.0007
Fixed Effects (Cross)				
_ENG--C	136.3966			
_SIN--C	-353.9280			
_MAL--C	-100.9958			
_THA--C	150.7350			
_VIE--C	92.12038			
_PHI--C	90.89797			
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.744810	Mean dependent var		96.71647
Adjusted R-squared	0.727797	SD dependent var		78.56463
SE of regression	40.98959	Akaike info criterion		10.33173

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Sum squared residue	201617.6	Schwarz criterion	10.53125
Likelihood logs	-657.3964	Hannan-Quinn criter.	10.41280
F-statistics	43.77965	Durbin-Watson stat	0.349361
Prob(F-statistic)	0.000000		

Source: Eviews 9.0

### b. Hypothesis Test Results together (Test F)

Based on the calculated F value in table 5.10 shows the value is 43.77 with probability approach zero or more small from alpha one percent , so can concluded in a manner together variable export net , exchange rate and growth economy influential significant to backup foreign exchange in six ASEAN countries.

### c. Hypothesis Test Results in a manner partial (t test)

#### 1. Variable export net

t value count variable export net in table 5.10 is 0.83 with probability 0.40 ( more big of the minimum alpha significance limit of ten percent ) so concluded variable export net No influential significant to backup foreign exchange in six ASEAN countries .

#### 2. Exchange Rate Variable

t value count variable the exchange rate in table 5.10 is 8.74 with probability approach zero ( more small from alpha one percent ) so concluded variable exchange rate influential positive significant to backup foreign exchange in six ASEAN countries . With thereby If exchange rate dollar experience increase by 1 point ( Appreciation ) towards currencies of six countries in ASEAN so backup foreign exchange will increase by 896.2 Million USD.

#### 3. Variable Growth Economy

t value count the variable p in table 5.10 is -3.49 with probability approach zero ( more small from alpha one percent ) so concluded variable growth economy influential negative significant to backup foreign exchange in six ASEAN countries . With thereby If growth economy rose by 1% then the foreign exchange reserves will down of 4.31 Million USD.

### D. Implications Economics And Policy

Based on results study show that from three influencing variables \_ backup foreign exchange six ASEAN countries only One variable ie export net no \_ significant influence temporary rates and growth economy influential significant . Same result similar with findings Shylajan and Ambassadors (2017) who found exchange rate influential positive and significant , as well as Osei (2018), meanwhile Uli LB (2016) also found rates and reserves foreign exchange own two way relationship . However happen difference with Ihsan's findings (2018) found exchange rate No influential significant to backup foreign exchange . For variable Sayoga and Tan (2014) who found exports positive influence \_ significant export to backup foreign exchange , as well Rahmayanti (2014) found that export influential negative significant to backup foreign exchange and Mahmudah (2019) found influence positive significant export to backup foreign exchange .

Research results This similar with those found by Yunella Safitri, & Dewi Zaini Putri. (2021) who found exchange rate influential positive significant temporary export No influential significant . Temporary happen difference findings with Dwi Puji Rahayu, & firdayetti firdayetti. (2021) who found exports and GDP effect positive and significant to backup foreign exchange .

On research This exchange rate show influence significant positive \_ to backup foreign exchange in six ASEAN countries . this \_ show when happening enhancement mark dollar America union or depreciated asean country currency so will increase backup foreign exchange them . Transmission the can explained If happen increase mark dollar America union or dollar appreciated cause prices goods export become cheap so that cause export increase so that will increase backup foreign exchange . Temporary results other export net No influential significant although coefficient the regression show direction positive matter This indicate that enhancement export net Not yet significant in move enhancement backup foreign exchange . Transmission the can explained possibility big Indonesian exports still own dependency to imported capital goods from overseas so \_ enhancement export need enhancement commodity imported capital goods and technology . Temporary variable growth economy show influence negative significant to backup foreign exchange , that is enhancement growth economy will impact to decrease backup foreign exchange , transmission This can explained that in six ASEAN countries show that they need backup foreign exchange in move growth economy , economy grow need financing and sources backup foreign exchange in control mark swap or exchange rate as well as tool payment For do import or pay debt abroad .

Required policy \_ in recommendation results study This is How increase backup foreign exchange , though findings show that exchange rate influential positive and significant to backup foreign exchange However No means policy depreciation considered appropriate so that control exchange rate still needed Because Still exists dependency to goods import , temporarily policy to

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enhancement export Keep going sought and commodity goods export expected own mark plus high and no \_ depend to purchased capital goods from abroad .

Growth economy is indicator macro very important economy in determine circumstances economy so that policy economy Of course just must still make an effort happening growth economics , based on results study show impact growth negative economy \_ to backup foreign exchange , need efforts to trace sources growth economy such , if source growth originate from loan or debt abroad as well imported capital goods matter This Of course just will drain foreign exchange , because For pay forest or loan the as well as goods import needed foreign exchange . So that policy in increase growth economy still done with No depend on possible sources \_ drain foreign exchange like imports , debt abroad .

## CONCLUSIONS

### Conclusions

Based on problem and goal study as well as results research , then as for conclusion from study This is as following : Based on ratio comparison backup Indonesia's foreign exchange against five ASEAN countries other show that reserve average \_ Indonesia's foreign exchange has ratio highest with Vietnam , namely 4.10 and the lowest with Singapore , which is 0.37. If seen results ratio This show that from six major countries in Asia southeast Indonesia only be in order to four with backup foreign exchange the biggest, above Indonesia there are Singapore, Thailand and Malaysia, while those are under Indonesia only Vietnam and the Philippines.

Based on results panel data regression with using fixed effect model shows that exchange rate influential positive significant and growing economy influential negative significant. Temporary export net sword influential significant to backup foreign exchange in six ASEAN countries.

### Suggestions

Recommended suggestions in study This is as following: (1) The Need for Improvement Efforts export with commodity excellence that has mark plus tall to foreign exchange with reduce content import to export net can significant in increase foreign exchange; (2) Guard stability mark exchange ( exchange rate ) order ago cross export and import can awake with Good with prioritize balance surplus \_ possible trade \_ add foreign exchange; dan (3) Reducing dependency use backup foreign exchange in move growth economy for example with reduce loan or debt abroad as well imports for growth the economy going on No impact negative to backup foreign exchange .

## REFERENCES

- 1) Asian Development Bank. Key Indicators For Asia and Pacific 2016 . Asian Development Bank Statistics. 2016
- 2) Asian Development Bank. Key Indicators For Asia and Pacific 2013 . Asian Development Bank Statistics. 2013
- 3) \_\_\_\_\_, 2013. Central Bureau of Statistics. Indonesia in Lifting 2003.
- 4) Dash, AK, Shylajan, CS, & Dutta, S. (2017). An Empirical Analysis of Macroeconomic Variables Affecting Foreign Exchange Reserves Accumulation in India. *Journal of Applied Business & Economics* , 19 (5), 69–80.
- 5) Dornbusch, Rudiger, Stanley Fischer, Richard Startz. *Macroeconomics*. 9th Edition. McGraww-Hill. 2004
- 6) Dwi Puji Rahayu, & firdayetti firdayetti. (2021). Determinants of the Influence of Exports, Imports and Gross Domestic Product on Indonesia's Foreign Exchange Reserves. *Economic Media* , 29 , 13–20.
- 7) Gasperz, Vincent. 1997. *Quality Management Implementation of Quality Concepts in Total Business Management* . Jakarta: PT. Main Library Gramedia
- 8) Gujarati, Damodar N. *Basic Econometrics* . 4th Edition. McGraw-Hill. 2004
- 9) Gujarati, Damodar N, 2003, *Basic Econometrics* .. Fourth edition, International Edition. MC Grow Hill.
- 10) Haryadi. 2007. *International Economic Theory and Policy*. Bogor: Biography
- 11) Ihsan Muhammad (2018) "analysis of Indonesia's foreign exchange reserves 1994-2015" Indonesian Islamic University
- 12) Mankiw, George N. *Macroeconomics* . 5th Edition. McGraw-Hill. 2001
- 13) Mahmudah.BK (2019) 'The effect of import and export on Indonesia's foreign exchange reserves' *Scientific journal of accounting and finance*. P4M STIE Putra Bangsa Kebumen
- 14) Nopirin 2003, *International Economics*, BPFE UGM yogyakarta
- 15) OSEI, DD (2018). Dynamics of Foreign Exchange Reserves Accumulation and Macroeconomic Stability: The Ghanaian Perspective. *Aziya i Afrika Segodnya* , 10 , 61–65.  
<https://e-resources.perpusnas.go.id:2111/10.31857/S032150750001018-1>
- 16) Rahmayanti.E (2014) "Analysis of Indonesia's foreign exchange reserves, Syiah Kuala University

## Determinants of Foreign Exchange Reserves of Six Countries in Southeast Asia

- 17) Sims, Christopher. Macroeconomics and Reality. Econometrica . 1980
- 18) Sayoga, Tan (2017) Analysis of Indonesia's foreign exchange reserves and the factors that influence them Journal of Economic Paradigma Vol.12.No.1, January —June 2017 ISSN: 2085-1960(print)
- 19) Uli, LB (2016). Analysis of Indonesia's Foreign Exchange Reserves. Journal of Regional Development and Financing Perspectives , 4 (1), 15-24. Retrieved from <https://online-journal.unja.ac.id/JES/article/view/3529>
- 20) Yunella Safitri, & Dewi Zaini Putri. (2021). Determinant Analysis of Foreign Exchange Reserves in Indonesia. Journal of Economic and Development Studies , 3 , 97.



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