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Analysis ot The Influence of Exchange Rates, Inflation, and Investment on Indonesia's Export Value (1990 – 2024)

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Abstrak

One way to boost Indonesia's economic growth is by increasing exports, resulting in a trade surplus. Inflation, investment, and exchange rates influence export value. This study uses the ARDL model to examine the influence of inflation, investment, and exchange rates on export value in both the short and long term. From the results of research using macroeconomic data, it can be seen that the inflation and investment variables have a significant positive effect on the value of Indonesian exports and the exchange rate variable has a significant negative effect in both the short and long term.

Kata kunci: Export Value, Inflation, Investment and Exchange Rate.

INTRODUCTION

To increase strong economic growth, one of the efforts made by every country is to engage in international trade. International trade is in the form of exports and imports of goods or services (Stein, Kursawe, & Köhler, 2023). If a country carries out exports that exceed imports, the country will experience a trade balance surplus because greater income comes in as a result of export activities than expenditure, namely imports (Muhammad Fathul Ilmi Al-Hanif, Fauzia Rahma Qurrota'aini, Navisatul Muna, & Hanifah Ratih Prastiwi, 2023). Indonesia is one of the largest exporting countries in the world, data from BPS shows that export performance in 2024 amounted to 264,703 million US dollars, increasing over the past 5 years amidst global problems, namely the Covid-19 pandemic from 2020 to 2021 and greeted again with elections and regional elections in several regions in 2024 which slowed down domestic economic activity, while export data in 2023 amounted to 258,774 million US dollars, in 2022 amounted to 291,904 million US dollars in 2021 amounted to 231,609 million US dollars and in 2020 amounted to 163,191 million US dollars. According to the Ministry of Trade, Indonesia's main export commodities for 2024 will be palm oil, coal , natural rubber, fishery products, textiles, apparel, coffee, shrimp, and cocoa. High export values can increase production and labor demand, thus boosting economic growth. Several factors that can increase export value are exchange rates, inflation, and investment. The exchange rate depreciates annually, with the IDR/USD exchange rate reaching IDR 16,162 in 2024 and IDR 15,935 in 2023 (Muhammad Fathul Ilmi Al-Hanif et al., 2023). From an export perspective, the depreciated exchange rate results in increased export volume because Indonesian exports are considered cheap internationally. Inflation also impacts Indonesian exports, with inflation reaching 1.57% in 2024 and 2.61% in 2023. Low inflation means that domestic prices generally decline, which can impact the production costs of exported goods, thereby increasing export volume (Sari, Jumiati, & Muslihatinningsih, 2019). Likewise, the capital that is really needed by exporters is a supporting factor for increasing exports, namely domestic and foreign investment capital. In 2024, domestic and foreign investment realization amounted to US$874,031 million, which has increased over the past 5 years . Based on this data, the author is interested in conducting research on "Analysis of the Influence of Exchange Rates, Inflation and Investment on Indonesia's Export Value 1990-2024" (Rahmadani, Yousida, Ritawaty, & Suzana, 2023).

Formulation of the problem

The formulation of the problem in this research is:

1. How does the exchange rate affect Indonesia's exports from 1990 to 2024?
2. How does inflation affect Indonesian exports from 1990 to 2024?
3. How does investment affect Indonesian exports from 1990 to 2024?

RESEARCH METHODS

Scope of Research

The scope of this research is to analyze the influence of exchange rates, inflation and exchange rate investments on the value of Indonesian exports from 1990 - 2024.

Data Types and Sources

The type of data used is secondary data in the form of a quantitative *time series , namely data in the form of numbers.* Data was obtained from the BPS website, the BI website, and library journals (Muhammad Fathul Ilmi Al-Hanif et al., 2023).

Data Analysis Model

The research method used to analyze the relationship and influence of exchange rates, inflation, and investment on Indonesia's export value between 1990 and 2024 is the *Autoregressive Distributed Lag* (ARDL) method. ARDL is a regression method that includes lags of both dependent and independent variables simultaneously (Sambaulu, Rotinsulu, & Lapian, 2022). Using this model, we can analyze long-term relationships when the explanatory variables are a mixture of 1(1) and 1(0) variables (Ningsih & Andiny, 2018). The ARDL estimator will produce consistent long-term coefficients that can be generated using *standard normal asymptotic theory* (Simanungkalit, 2020). One of the advantages of this ARDL approach is that it produces consistent estimates with good long-term coefficients regardless of whether the explanatory variables or regressors are 1(0) or 1(1) (Aulia Rahmasari, 2018 ; 2).

The ARDL equation model used in this study is as follows:

$Et \quad = \beta_{1i} + \beta_{1i} Inf_{t-1} + \beta_{1i} E_{t-1} + \beta_{1i} I_{t-1} + e_t$

Information:

E_t = Indonesian Exports (million US$)

Inf_t = Inflation (%)

E_t = Exchange rate Rp/dollar (Rp)

I_t = Investment (Million US$)

RESULTS AND DISCUSSION

1. ARDL Model in the Short Term

To determine whether inflation, exchange rates, and investment variables influence Indonesia's export value from 1990 to 2024, we use the short-term ARDL model. To do this, we conduct the following tests (Koswara, 2024):

a . Unit Root Test

Stationarity data can searching for using the unit roots test (Lestari, Nainggolan, & Damanik, 2022). In In this study, the stationary test was carried out using the unit root test with *Augmented Dickey Fuller Test (ADF Test)* method on the grounds that *ADF The test* has taken into account the possibility of autocorrelation in *the errors. term* if *the series* used is non-stationary.

Table 1. Stationarity Test

Variables	Unit Root	ADF t-Stat	Critical Value 5%	Prob	Information
Export	Level	- 1 .244834	- 2 .951125	0.6433	Non-Stationary
	First Diff	-5,275736	-2.954021	0.0001	Stationary
Inflation	Level	-1.252275	-2.971853	0.6370	Non-Stationary
	First Diff	-3.391271	-2.971853	0.0200	Stationary
Exchange rate	Level	-2,157276	-2.957110	0.2250	Non-Stationary
	First Diff	-4,899329	-2.954021	0.0004	Stationary
Investmen	Level	-0.470406	-2.963972	0.8837	Non-

t					Stationary
	First Diff	-1.628127	-2.963972	0.4563	Non-Stationary
	Second Diff	-7.608994	-2.963972	0.0000	Stationary

b . Cointegration Test

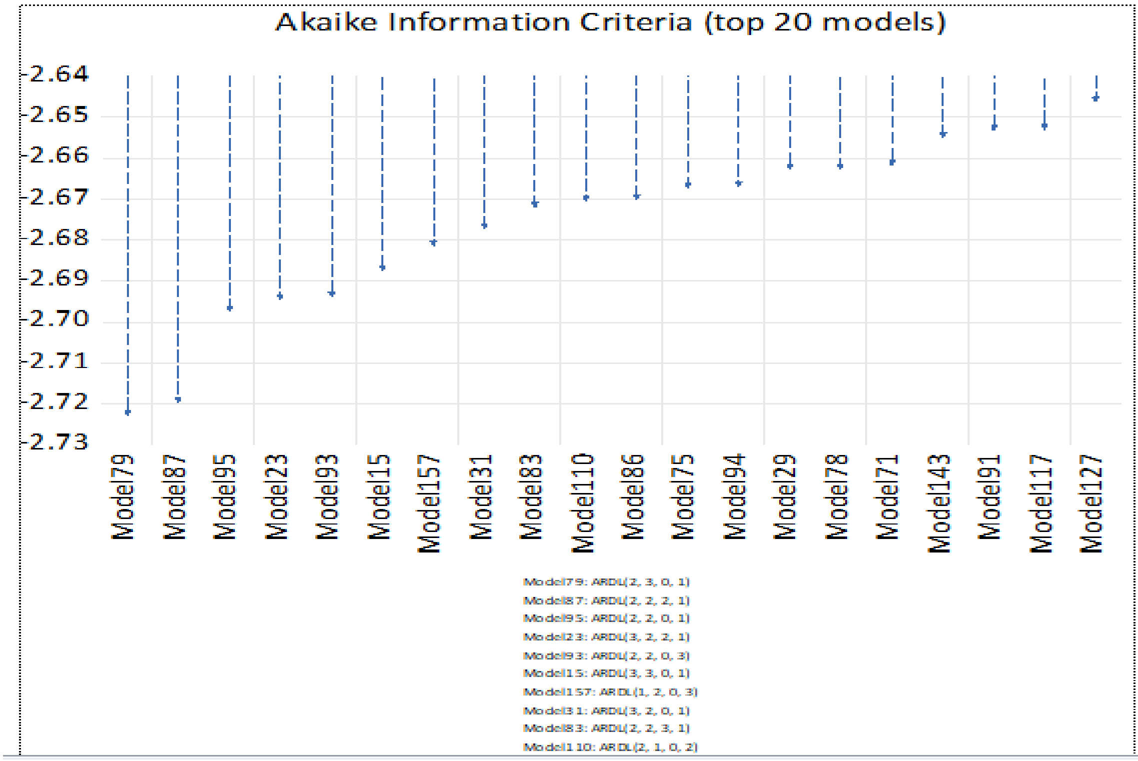
Test This done after test stationarity And has integrate at the same degree . The cointegration test is a test of the existence of whether or not connection term long between variables free And variables tied (Suarmanayasa, 2021). Objective main test cointegration This is For know whether residual stationary cointegrated or not. If the variables are co-integrated so there is connection Which stable in term long. On the contrary If No there is cointegration between variables so the implication of the absence of long-term relationship engagement (Suyanto & Tjandrasa, 2023). The term cointegration is also known as the term error, because the deviation to equilibrium term long corrected in a way gradually through series partial adjustment term short. From the test results, it was obtained that the probability value of At most 1 to 3 was above 5% so that there was no cointegration between the variables so that the ARDL model could be used.

Table 2. Cointegration Test

Hypothesis No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob. **
None *	0.896740	100,0448	47,85613	0.0000
At. Most 1	0.424232	25,11813	29.79707	0.1573
At. Most 2	0.174180	6,900456	15.49471	0.5893
At. Most 3	0.017570	0.584949	3.841465	0.4444

c . Determining Optimal Lag

From the results of the lag length test, the best Akaike information criteria (AIC) value is ARDL (2,2,1,1), meaning that the variables in the significant model are export value totaling 2 lags, inflation totaling 2 lags, investment totaling 1 lag and exchange rate totaling 1 lag.



c . ARDL Model Test

To ensure whether the ARDL model is the right model for the variable equation model, an ARDL model test is conducted. From the estimation results using the short-term ARDL model, the following results are obtained (Islmail, Noviartati, Syahril, & Fikri, 2021):

Table 3. Short-Term ARDL Model Estimates

Variables	Selected Model ARDL (2,2,1,1) Coefficient	t-statistic	Prob.
D(export-1)	0.110059	0.629396	0.5356
D(Export-2)	-0.352153	- 2.013669	0.0564
D(Inflation)	0.001358	1.134503	0.2688
D(Inflation-1)	0.003328	1.903044	0.0702
D(Inflation-2)	0.002199	2,304691	0.0310
D(Investment,2)	-0.005859	- 0.083282	0.9344
D(Investment-1,2)	0.094009	1.451636	0.1607
D(Currency)	-0.048351	-	0.7296

		0.350076	
D(Currency-1)	-0.386576	-2.029055	0.0547
C	0.049152	3.452883	0.0023
R-squared	0.416746	Mean	0.027866
Adjusted R-squared	0.178142	Hannan-Quinn Critr	-2.626614
F-statistic	1.746603	Durbin-Watson Stat	1,792252

From the short-term ARDL model estimation results, the following is obtained:

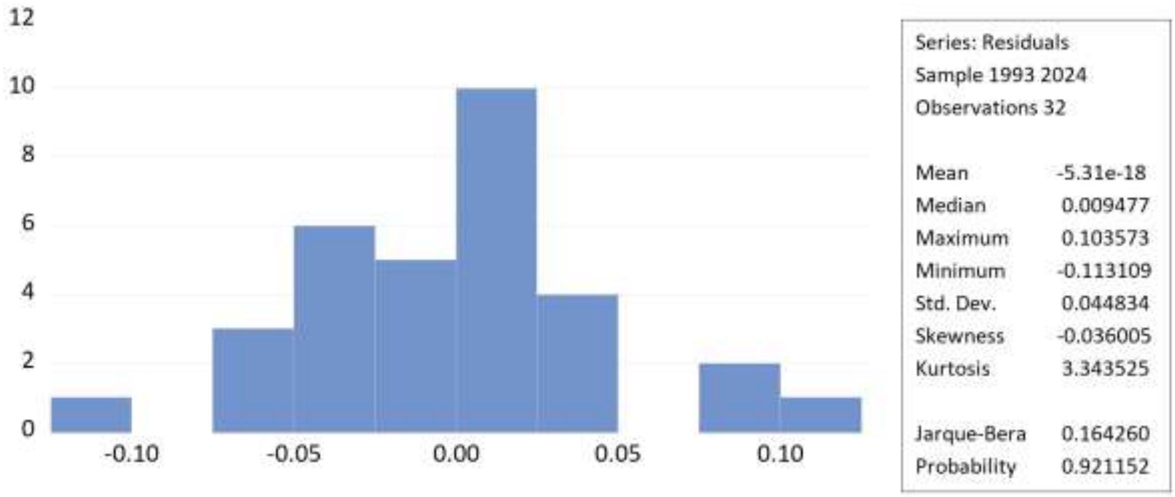
1. Inflation had a positive and significant effect at the 5% alpha level on export value over the past two years. This indicates that every 1% increase in inflation will result in a 0.21 % increase in export value .
2. Investment had a significant positive effect at the 10% alpha level last year. This indicates that every 1% increase in investment will result in a 9.40 % increase in export value (Mahafani, Puspa, Khasanah, Wulandari, & Andriani, 2021).
3. The exchange rate had a negative and significant effect at the 5% alpha level last year (Maheswara, 2023). This indicates that every 1% increase in the exchange rate will result in a 38.65 % decrease in export value (Saputra, Kartawinata, Wijayangka, & Moeliono, 2019).

d . Classical Assumption Test

To ensure that the ARDL model is free from the Classification Assumption Test, the following tests can be carried out (Herlianto, 2013):

a . Normality Test

Judging from the Jarque Bera probability of 0.92 > 0.05, it means that it is free from normally distributed residuals (Rumbayan, 2024).



b . Autocorrelation Test

Autocorrelation test using the Breusch test, the chi square probability value of obs*R-squared is 0.2527 > 0.10, meaning that there is no serial correlation in the sample data used (Mulyani, 2018).

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.940487	Prob. F(2,20)	0.4070
Obs*R-squared	2.750845	Prob. Chi-Square(2)	0.2527

c . Heteroscedasticity Test

In the heteroscedasticity test using the Breausch test, the chi square probability value at obs*R- Square 4.44 > 0.10 can be concluded that the data does not experience heteroscedasticity (Sari et al., 2019).

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.394686	Prob. F(9,22)	0.9246
Obs*R-squared	4.448528	Prob. Chi-Square(9)	0.8795
Scaled explained SS	2.463777	Prob. Chi-Square(9)	0.9818

d . Multicollinearity Test

From the test results, it was found that the VIF value <10 can be concluded that there is no multicollinearity problem.

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
D(EKSPOR(-1))	0.030578	1.468362	1.164919
D(EKSPOR(-2))	0.030583	1.471758	1.095677
D(INFLASI)	1.43E-06	5.386871	5.386692
D(INFLASI(-1))	3.06E-06	11.52099	11.51938
D(INFLASI(-2))	9.10E-07	3.426650	3.426488
D(INVESTASI,2)	0.004949	2.353633	2.351321
D(INVESTASI(-1),2)	0.004194	1.994868	1.992603
D(KURS)	0.019076	3.088439	2.918067
D(KURS(-1))	0.036298	5.881638	5.546844
C	0.000203	2.289376	NA

3. ARDL Model in the Long Term

To determine whether the exchange rate, inflation, and investment variables influence Indonesia's export value from 1990 to 2024, we use the long-term ARDL model. To do this, we conduct the following tests (Nadya & Aimon, 2020):

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFLASI)	0.005543	0.002807	1.974435	0.0610
D(INVESTASI,2)	0.070969	0.096738	0.733620	0.4709
D(KURS)	-0.350156	0.179961	-1.945734	0.0646
C	0.039572	0.009361	4.227468	0.0003

From the results of the long-term model estimation, the following is obtained:

1. Inflation has a positive and significant effect on export value in the long run at 10% alpha. This means that every 1% increase in inflation results in a 0.5543 % increase in export value.
2. Investment has a positive but insignificant effect on export value in the long term. This means that every 1% increase in investment results in a 7.09 % increase in export value.
3. The exchange rate has a negative and significant effect on export value in the long run at 10% alpha. This means that every 1% increase in the exchange rate will result in a 35.01% increase in export value .

a . Boundtest Cointegration Test

In the long term, the ARDL model can be assessed for cointegration using the Bound Test. The Bound Test is applied to determine the confidence level for a variable in the study (Saputri, Fathihani, & Randyantini, 2024). Diagnostic testing with the Bound Test can be performed by comparing the calculated F-Statistic value with the critical value. If the value of the F-Statistic is still less than the lower bound, it can be concluded that there is no cointegration between the variables. However, if the F-Statistic value is still greater than the upper bound, it can be concluded that cointegration occurs between the variables. When the F-Statistic value is still between the two , the results obtained cannot be concluded.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	6.089589	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

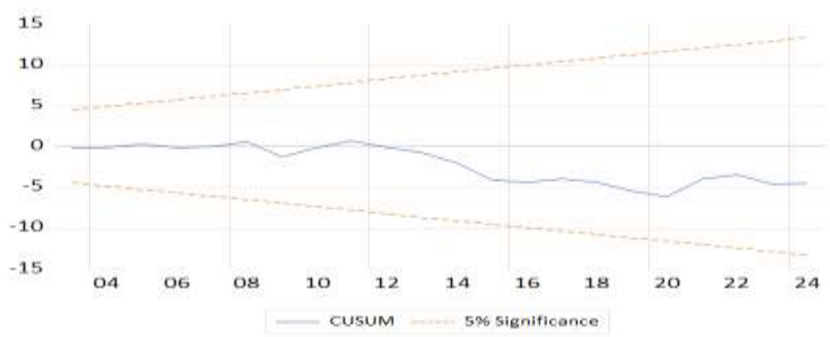
From the results of the F-Bounds Test, the F-statistic value obtained was greater than 3.2 , meaning that cointegration occurs between the variables so that the long-term model can be used (Damayanti & Meilina, 2023).

b . Stability Test

Long-term stability testing of the Autoregressive Distributed Lag (ARDL) method can be done using CUSUM and CUSUMQ.

How to perform ARDL stability test

1. CUSUM plot at 5 percent critical value
2. Make sure the CUSUM plot does not go outside the upper and lower limit lines.
3. If the CUSUM plot meets the requirements, then the estimate is considered stable.



The results of the Cusum test and Cusum of squares showed that the blue line is within the red dotted line at a 5% significance level and forms a linear line (Putri & Andayani, 2022). The results of the model stability test explain that the regression coefficients are stable and have the same hypothesis in the long-term perspective (Menajang, 2019).

CONCLUSION

From the research results, the following conclusions can be obtained:

1. In the short term, inflation had a positive and significant effect at the 5% alpha level on export value over the past two years. This indicates that every 1% increase in inflation will result in a 0.21 % increase in export value .
2. In the short term, investment had a significant positive effect at the 10% alpha level last year. This indicates that every 1% increase in investment will result in a 9.40 % increase in export value .
3. In the short term, the exchange rate had a negative and significant effect at the 5% alpha level last year. This indicates that every 1% increase in the exchange rate will result in a 38.65 % decrease in export value .
4. In the long run, inflation has a positive and significant effect on export value at 10% alpha. This means that every 1% increase in inflation results in a 0.5543 % increase in export value .
5. In the long term, investment has a positive but insignificant effect on export value. This means that every 1% increase in investment results in a 7.09 % increase in export value.
6. In the long run, the exchange rate has a negative and significant effect on export value at 10% alpha. This means that every 1% increase in the exchange rate will result in a 35.01% increase in export value .

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