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Monetary Variables and Dilemma of Misery Index: A Time Series Analysis Evidence in Indonesia

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ABTSRAK

Indeks Kesengsaraan mencerminkan tingkat kesulitan ekonomi melalui pengangguran dan inflasi, sehingga menjadi indikator utama untuk menilai bagaimana perubahan ekonomi memengaruhi masyarakat. Penelitian ini bertujuan untuk menganalisis hubungan antara variabel moneter seperti suku bunga, jumlah uang beredar, dan nilai tukar dengan indeks Misery. Keaslian penelitian ini terletak pada fokusnya terhadap indeks Misery sebagai indikator komprehensif kesejahteraan makroekonomi, bukan hanya menganalisis inflasi dan pengangguran secara terpisah. Data penelitian diperoleh dari Badan Pusat Statistik (BPS) dan Bank Indonesia, dengan cakupan data triwulanan. Metode yang digunakan adalah Vector Error Correction Model (VECM). Hasil penelitian menunjukkan adanya hubungan jangka panjang dan jangka pendek antara variabel moneter dan indeks Misery. Temuan ini mengimplikasikan bahwa stabilisasi nilai tukar dan pengelolaan moneter yang hati-hati dapat memainkan peran penting dalam mengurangi tekanan ekonomi di Indonesia.

Kata Kunci: Indeks Kesengsaraan, Variabel Moneter, *Vector Error Correction Model*

ABSTRACT

The Misery Index captures economic hardship through unemployment and inflation, making it a key indicator of how economic shifts affect society. The study aims to analyze the relationship between monetary variables such as interest rates, money supply, and exchange rates, and the misery index. The originality of this research lies in its focus on the misery index as a comprehensive indicator of macroeconomic well-being, rather than analyzing inflation and unemployment separately. The data were obtained from Indonesia's Central Bureau of Statistics and Bank Indonesia, covering a quarterly period. The method used is the Vector Error Correction Model (VECM). The study finds evidence of both long-term and short-term relationships between monetary variables and the misery index. The implications of these findings highlight that exchange rate stabilization and prudent monetary management can play a crucial role in mitigating economic hardship in Indonesia.

Keywords: Misery Index, Monetary Variable, Vector Error Correction Model

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INTRODUCTION

The important history of monetary policy formulation dates back to the *Great Depression of the* 1930s, which has been called the worst crisis in history. Many economists agree that the decline in the money supply in large numbers (up to 28 percent) was a major factor in the Great Depression. More than 9,000 banks in the United States could not operate due to defaults by banks on depositors as a result of the Wall Street crash. As a result of this event, unemployment in the United States rose sharply, and prices fell drastically (Mankiw, 2016). On the other hand, history has also explained that the monetary authority's negligence in printing too much money supply can cause hyperinflation, as happened in Germany and Zimbabwe, which led to monetary reform (Mankiw, 2016). In Indonesia itself, hyperinflation occurred in 1965, reaching 600% due to negligence in printing too much money for fiscal funding and constructing the Lighthouse project (Warjiyo and Solikin, 2003). The contrasting conditions above, in conditions of too much or too little money supply, imply that monetary stability is an important thing that needs to be maintained so that the central bank, as the monetary authority, has the authority to carry out monetary policy.

Monetary policy is considered capable of solving problems in the economy, both from within and outside the economy, and ensuring conditions remain stable through interventions in pricing and wage labor (Friedman, 1968). Macroeconomic stability is characterized by price stability, improvement in the growth of real output value characterized by economic growth, and widespread availability of employment opportunities (Warjiyo and Solikin, 2003). Stable inflation and low unemployment are the targets of economic development (Blanchard and Johnson, 2012). However, price stability and increased employment opportunities cannot occur together because there is an element of trade-off where the government has to sacrifice one of the two variables (Nopirin, 1987).

Table 1.
The Level of Inflation and Unemployment Rate in Indonesia in 2012-2022

Years	Inflation (%)	Unemployment (%)
2012	4,3	6,13
2013	8,38	6,17
2014	8,36	5,94
2015	3,35	6,18
2016	3,02	5,61
2017	3,61	5,5
2018	3,13	5,3
2019	2,72	5,23
2020	1,68	7,07
2021	1,87	6,49
2022	5,51	5,86

Source: (Bank Indonesia, 2023)

Table 1 summarizes Indonesia's inflation and unemployment rates have fluctuated over the last ten years. The highest inflation rate occurred in 2013 at 8.38% due to the increase in subsidized fuel prices at the end of June 2013 and the increase in food prices (Bank Indonesia, 2013). Meanwhile, the lowest inflation rate occurred in 2020 at 1.68%, part of the government's strategy to increase people's consumption power against a sluggish economy due to the COVID-19 pandemic (Bank Indonesia, 2020). Meanwhile, the highest unemployment rate occurred in 2020 at 7.07, while the lowest occurred in 2019 at 5.23. Massive layoffs caused high unemployment during the early days of the COVID-19 pandemic (Bank Indonesia, 2020).

The trade-off effect between inflation and unemployment can also be seen in Table 1. When the inflation rate is low, it is accompanied by a high unemployment rate. Although there is a gain from the decline in inflation, it is also a loss due to the surge in unemployment. It means that the decline in inflation will be counteracted by the increase in social costs caused by high unemployment. If these conditions remain unchanged, the level of misery will remain unchanged. One index that can describe these conditions is the misery index, which is measured by summing the unemployment and inflation rates as part of the problems in the economy (Ugondah and Adindu, 2021).

The Misery Index describes the discomfort in an economy depicted through unemployment and inflation rates. A higher unemployment rate indicates a declining economy and harms society (Ugondah and Adindu, 2021). The misery index used in this study refers to Okun's view of summing inflation and unemployment rates, although there are many other approaches. Using the basic misery index model has become a basic and inspiring idea in developing other models Cohen *et al.* (2014). On the other hand, there is also a control in this research model that explains its relationship with monetary variables. The monetary variables used in the form of Interest Rate, Money Supply, and Exchange Rate refer to the views of Mankiw (2016), which states that monetary policy refers to decisions in a country's currency system, exchange rates, and banking.

This study refers to several previous studies, including research conducted by Madurapperuma (2023) showing that an increase in money supply can cause inflation. Research by Wang *et al.*, (2019) shows a positive relationship between the real interest rate and the misery index. The recommendations from this study also show that one of the core objectives of macroeconomic policy is to reduce inflation and unemployment, so the government needs to determine the right policy.

Selim and Hassan (2019) related Interest-Free Monetary Policy (IFMP) to misery which is the conclusion that countries pursuing IFMP have a lower misery index than countries that do not pursue IFMP. Likewise, Effiong *et al.*, (2022) which discusses monetary policy by the central bank on the misery index in Nigeria with the results of monetary policy, has a significant positive relationship to inflation and a significant negative to unemployment. Other empirical results are also obtained from research Ugondah and Adindu (2021) with the discussion of macroeconomics and the misery index with the results of variable money supply and interest rate affect the misery index.

The relationship between the exchange rate and the misery index refers to research conducted by (Lopez, 2022).

Based on this background and the lack of research references related to monetary variables and the misery index, this research needs to be done to add empirical results and references to be used as material for future policy evaluation. This study aims to determine the long-term and short-term relationship between monetary variables and the misery index in Indonesia using the Vector Error Correction Model (VECM) method with quarterly time series data from 1995q51 until 2022q4.

RESEARCH METHOD

Data

The type of research used is quantitative research with time series analysis. The data used is quarterly secondary data in Indonesia from 1995:Q1 to 2022:Q4. The secondary data used is the misery index obtained through the summation of inflation and open unemployment rates, then monetary variables in the form of interest rates, money supply, and exchange rates obtained through the Central Bureau of Statistics and Bank Indonesia.

Table 2.
Data Measurement

Variable	Variable Definition	Frequency	Source
Misery Index	Inflation	Quarterly	BPS
	Unemployment Rate	Quarterly	BPS
Monetary Variable	BI Rate	Quarterly	BI
	Money Supply	Quarterly	BI
	Exchange Rate	Quarterly	BI

Source: Authors' Own

Some secondary data used is presented in different time units, namely in monthly and semesterly units. Therefore, some treatment of the data obtained is carried out. Monthly data, such as inflation, is calculated into semesterly inflation by first equalizing the base year of inflation to 2018=100. Annual data is given *treatment* so that it is presented in quarter form. The interpolation process is assisted automatically using Eviews 13.

Analysis Technique

The analysis technique in this study uses the Vector Error Correction Model (VECM) approach. VECM is a restricted VAR model due to data that is not stationary at the level but has cointegration. The VAR / VECM model is very suitable for modeling economic problems. The VAR or VECM model eliminates the function between the dependent and independent variables, meaning that regression testing does not need to be done to determine whether variable x affects y. The VAR/VECM model eliminates the function

between the dependent and independent variables. That is because the VAR / VECM model is minimal in the theoretical approach but refers more to events or phenomena, so it is suitable for forecasting (Gujarati, 2015) In general, the VECM model is as follows:

$$\Delta y_t = \mu_{0x} + \mu_{1x}t + \Pi_x y_{t-1} + \sum_{i=1}^{k-1} \Gamma_{ix} \Delta y_{t-1} + \varepsilon_t \quad \text{.....(1)}$$

Description

y_t = vector containing the analyzed variables

μ_{0x} = vector intercept

μ_{1x} = time trend

Π_x = cointegration matrix in the long run

y_{t-1} = variable in level

Γ_k = regression coefficient matrix

k-1 = the VECM order of the VAR

ε_t = error term

RESULT AND DISCUSSION

Stationarity Test

The first step in analyzing time series data using the VAR / VECM model is to conduct a stationarity test. Whether or not the data used has been stationary to avoid spurious results (Lopez, 2022). The stationary test in this study uses the root test with the *Augmented Dickey-Fuller test*.

Table 3.
Root Test Result

Variable	ADF - Level		ADF - First Differencing	
	Trend & Intercept	Intercept	Trend & Intercept	Intercept
Misery Index	0.1195	0.0526**	0.0000***	0.0000***
Interest Rate	0.0260***	0.5317	0.0000***	0.0000***
Money Supply	0.0585**	0.2478	0.0352***	0.0225***
Exchange Rate	0.0843	0.0178***	0.0000***	0.0000***

Note: *** denote rejection of the unit root hypothesis at 5%, ** denote rejection of the unit root hypothesis at 1%.

Source: Authors' Own

Based on Table 3, it is known that the ADF test at the level gets non-stationary results on Trend & Intercept and Intercept. Seen through the p-value results in each variable greater than 0.05. Therefore, it is necessary to test at the first differencing level. As for the ADF first differencing test, each variable gets stationary results on Trend & Intercept, and Intercept is seen through the p-value smaller than 0.05.

Optimum Lag Test

Based on the stationarity test results, it can be concluded that the suitable model to use is VECM (*Vector Error Correction Model*). The first step in VECM testing is to determine the optimum number of lags used in the model. The information in lag selection can be seen from the Likelihood Ratio (LR), Financial Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn Criterion (HQ) values.

Table 4.

Lag Length Criteria Result

Lag	LR	FPE	AIC	SQ	HC
0	NA	0.567105	10.78429	10.88600	10.82550
1	1071.876	1.53e-05	0.264954	0.773491*	0.470978
2	53.62821	1.19e-05	0.008139	0.923505	0.378981
3	39.85585	1.05e-05	-0.122145	1.200051	0.413515
4	63.08351	6.93e-06	-0.539550	1.189475	0.160929
5	48.12847	5.34e-06	-0.811719	1.324135	0.053578*
6	16.55487	5.98e-06	-0.713582	1.829101	0.316534
7	41.88787*	4.76e-06*	-0.964395*	1.985118	0.230540
8	21.66912	4.92e-06	-0.961901	2.394441	0.397852

Note: * indicates lag order selected by the criterion

Source: Authors' Own

Based on Table 4, it is known that the optimum lag to be used in the model is the seventh lag, as in the FPE and AIC values.

Stability Test

After the optimum lag test results are obtained, it is necessary to conduct a stability test to confirm that the selected lag is truly optimum in VECM modeling to obtain accurate results.

Table 5.

AR Roots Table

Root	Modulus
The 0.992774	0.992773
0.853727	0.853726
0.809414	0.809414
0.537233	0.537232
0.506519 - 0.115169i	0.519447
0.506519 + 0.115169i	0.519447
-0.410366	0.410365
-0.040541	0.040540

Source: Authors' Own

Based on Table 5, it is known that the lag selection in the model is optimal. This is evidenced by the modulus value in the stability test, which yields a value of less than 1.

In addition, it can also be seen through the AR Roots Graph results, where the point is in a circle.

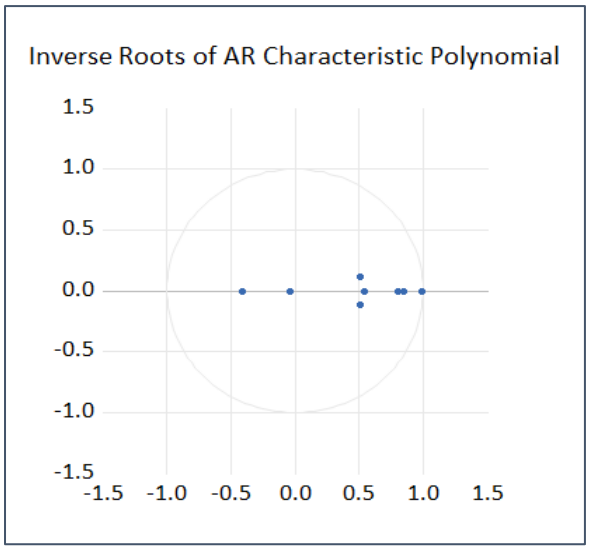

Figure 1. AR Roots Graph
Source: Authors' Own

Granger Causality Test

Table 6. supports the results of impulse response forecasting. It is necessary to conduct a Granger causality test to determine whether the variables used in the study are related to each other. Granger causality test in this study is only tested on the equation of monetary variables and misery index.

Table 6.
Granger Causality Test

Null Hypothesis:	F-Statistic	Probability	Decision
IR does not Granger Cause MI	4.18538	0.0005***	Reject
MI does not Granger Cause IIR	1.10143	0.3692	Do Not Reject
LN_MS does not Granger Cause MI	3.87969	0.0010***	Reject
MI does not Granger Cause LN_MS	1.41743	0.2081	Do Not Reject
LN_EXR does not Granger Cause MI	5.82609	0.0000***	Reject
MI does not Granger Cause LN_EXR	2.34174	0.2664	Do Not Reject
LN_MS does not Granger Cause IR	1.44196	0.1985	Do Not Reject
IR does not Granger Cause LN_MS	2.34174	0.0304***	Reject
LN_EXR does not Granger Cause IR	1.16907	0.3285	Do Not Reject
IR does not Granger Cause LN_EXR	1.35467	0.2344	Do Not Reject
LN_EXR does not Granger Cause LN_MS	15.0394	0.0000***	Reject
LN_MS does not Granger Cause LN_EXR	1.26570	0.2763	Do Not Reject

Note: * denotes rejection of hypothesis at 5% level.

Source: Authors' Own

Based on Table 6 Granger causality test results, it can be seen that almost all variables have a unidirectional causality relationship. Only the interest rate and exchange rate do not have a causality relationship. It is indicated by a p-value greater than 0.05.

Cointegration Test

The cointegration test is an important step in VAR/VECM testing to determine whether the data used has cointegration. If there is cointegration in the data, then there is a long-term relationship, and the most suitable model to use is VECM.

Table 7.
Cointegration Test Result

Trace				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None*	0.320992	96.10692	47.85612	0.0000
At most 1*	0.233314	55.84617	29.79707	0.0000
At most 2 *	0.170045	28.21554	15.49471	0.0004
At most 3*	0.081413	8.831591	3.841465	0.0030
Maximum Eigenvalue				
None*	0.320992	40.26074	27.58433	0.0007
At most 1*	0.233314	27.63063	21.13161	0.0052
At most 2 *	0.170045	19.38395	14.26460	0.0070
At most 3*	0.081413	8.831591	3.841465	0.0029

Note: * denotes rejection of the hypothesis at 5% level
Source: Authors' Own

Table 7 shows the cointegration test that the data in the study used has cointegration. It is indicated by the trace statistic and maximum eigenvalue values, which are greater than the critical value, and the p-value is smaller than 0.05. Therefore, it can be concluded that there is a long-term relationship in the model.

VECM Result

Table 8.
Long Run VECM Result

	Misery Index		
	Interest Rate	ln_Money Supply	ln_Exchange Rate
Coefficient	2.827455	15.34075	15.91977
t-statistic	2.10341	2.10341	2.03496

Note: Signification level at 5%
Source: Authors' Own

Table 8 shows that monetary variables such as Interest Rate, Money Supply, and Exchange Rate have a long-term relationship to the Misery Index. This is indicated by the value of the t-statistic is greater than the t-table. It means that monetary policy has a significant role in preventing an increase in the misery index. The more stable the monetary policy, the more the misery index will be corrected.

Table 9. Short Run Monetary Variables on Misery Index

Misery Index							
Interest Rate	Lag						
	1	2	3	4	5	6	7
Coefficient	0.02237	-0.17860	0.22491	0.50942	-0.22080	-0.56223	0.66320
t-statistic	0.1270	-1.0170	1.1895	2.9660	-1.2214	-3.4118	3.56413
Money Supply	Lag						
	1	2	3	4	5	6	7
Coefficient	-12.3347	-15.8699	-16.3530	-13.8066	4.56315	-4.34492	-0.00159
t-statistic	-1.8413	-2.4449	-2.4503	-2.1500	-0.7113	-0.0226	-1.0378
Exchange Rate							
	1	2	3	4	5	6	7
Coefficient	3.96335	6.3088	4.36745	-2.27251	2.42000	2.57386	4.43026
t-statistic	2.4365	3.5412	2.2755	-1.0780	1.0471	1.1058	1.9286

Note: Signification level 5% level

Source: Authors' Own

Table 9 shows that all monetary variables have a short-term relationship with the misery index, which is indicated by the value of the t-statistic is greater than the t-table. The interest rate variable obtained significant results at lag 4, 6, and 7. The money supply variable obtained significant results at lag 2, 3, and 4. The last, the exchange rate obtained significant results at lag 1, 2, and 3.

Table 10.

Short Run Misery Index, Exchange Rate, and Money Supply on Interest Rate

Misery Index	Lag						
	1	2	3	4	5	6	7
Coefficient	0.04163	0.02393	0.03962	0.00048	0.01848	-0.04420	0.00568
t-statistic	0.4900	0.2375	0.4118	0.0050	0.2081	-0.5376	0.0863
Money Supply	Lag						
	1	2	3	4	5	6	7
Coefficient	-3.40586	-5.17475	-0.32862	-6.94754	2.96448	-2.84553	-4.46884
t-statistic	-0.6963	-1.0918	-0.0674	-1.4817	0.63291	-0.6301	-1.0173
Exchange Rate	Lag						
	1	2	3	4	5	6	7
Coefficient	-0.00603	1.38667	0.66338	3.44039	-0.33010	0.27774	1.26445
t-statistic	-0.0050	1.0660	0.4733	2.2352	-0.1956	0.1634	0.7538

Note: Signification level at 5%

Source: Authors' Own

Table 10 shows that only the exchange rate variable has a short-term relationship with the interest rate variable Which is indicated by the value of t-statistic is greater than the t-table. The exchange rate variable obtained significant results at lag 4.

Table 11.
Short Run Misery Index, Exchange, and Interest Rate on Money Supply

Misery Index	Lag						
	1	2	3	4	5	6	7
Coefficient	0.00149	-0.00094	-0.00096	0.00423	0.00316	-4.34492	0.00159
t-statistic	0.7536	-0.4021	-0.4300	1.8938	1.5264	-0.0226	1.0378
Interest Rate	Lag						
	1	2	3	4	5	6	7
Coefficient	0.00151	0.007416	-0.00034	-0.00365	-0.00244	0.00949	0.00014
t-statistic	0.0502	2.4775	-0.1076	-1.2489	-0.7938	3.3791	0.0460
Exchange Rate	Lag						
	1	2	3	4	5	6	7
Coefficient	0.10351	0.08551	0.17826	-0.13086	-0.01168	-0.00439	0.07538
t-statistic	3.7336	2.8162	5.4492	-3.6424	-0.2967	-0.1108	1.9252

Note: Signification level at 5%

Source: Authors' Own

Table 12.
Short Run Misery Index, Money Supply and Interest Rate on Exchange Rate

Misery Index	Lag						
	1	2	3	4	5	6	7
Coefficient	0.01788	0.02231	0.01674	0.01183	0.01554	0.01099	0.00446
t-statistic	2.0925	2.2039	1.7299	1.2278	1.7401	1.3291	0.6736
Interest Rate	Lag						
	1	2	3	4	5	6	7
Coefficient	0.00747	0.00121	0.01353	-5.86775	-0.01030	0.02365	0.02411
t-statistic	0.5773	0.0938	0.9748	-0.0046	-0.7757	1.9541	1.7646
Money Supply	Lag						
	1	2	3	4	5	6	7
Coefficient	-0.51392	-0.08204	-0.46533	0.30392	0.20453	-0.31964	0.53592
t-statistic	-1.0445	-0.1720	-0.9492	0.6443	0.4341	-0.7037	1.2133

Note: Signification level at 5%

Source: Authors' Own

Table 11 shows that the interest rate and exchange rate have a short-term with the interest rate variable which is indicated by the value of t-statistic is greater than the t-table. The interest rate variable obtained a significant result at lag 1 and 4. Likewise, the exchange rate variable obtained significant result at lag 1 to 4. Table 12 shows only

the misery index variable has a short-term relationship with the exchange rate variable Which is indicated by the value of t-statistic is greater than the t-table. The misery index obtained significant result at lag 1 and 2.

IRF (Impulse Response Function) Analysis

IRF (Impulse Response Function) is a method to determine how the shock occurs from endogenous variables on the shock given by other variables. It can be concluded that IRF is a forecasting method to measure the effect of a given shock on the current and future periods time.

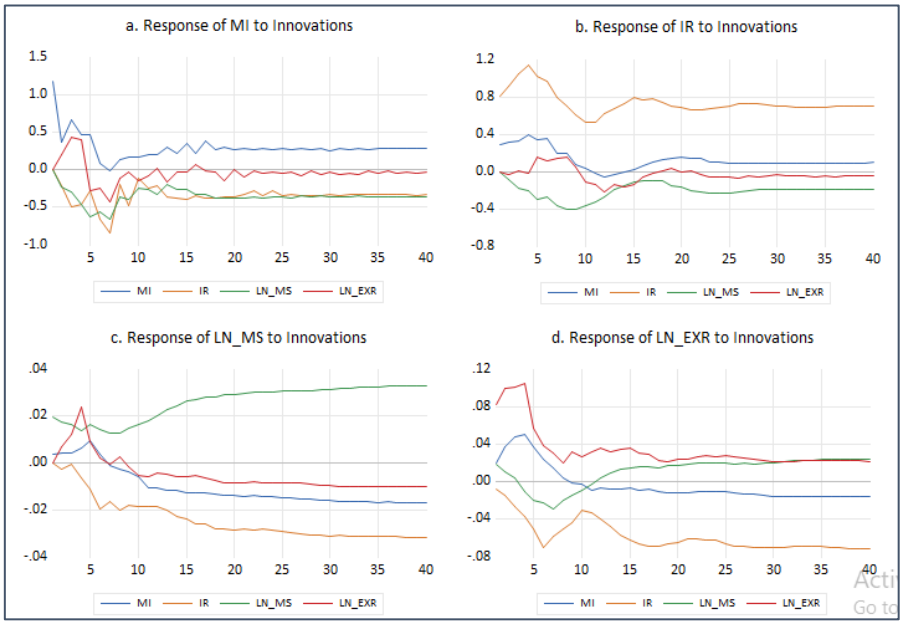

Figure 2. Response to Cholesky One S.D. (d.f. adjusted) Innovations

Source: Authors' Own

Figure 2 shows that monetary variables can significantly affect the misery index in the early quarters until the end of the quarter. There are stable fluctuations starting from the twentieth quarter. The shock given by the interest rate variable can make the misery index decrease from the first quarter to the fifteenth quarter. Likewise, the money supply variable decreases the misery index from the first semester to the tenth semester. In contrast, the exchange rate variable's shock increases the misery index from the first to the fifth quarter. Then in the next period, the misery index decreased until the eighth quarter.

Furthermore, Figure 2b shows that the shock given by the misery index, money supply, and exchange rate variables tend to cause fluctuating changes. Then in Figure 2c shows that the shock given by the misery index, interest rate, and exchange makes the money supply experience a steady decline. However, fluctuations in the early period preceded it. The Last, Figure 2d shows that the shock given by the misery index, interest rate, and money supply makes the exchange rate fluctuate in the initial quarter and tend to be more stable after that.

FEVD (Forecast Error Variance Decomposition)

FEVD (Forecast Error Variance Decomposition is a method to determine the contribution of other variables to endogenous variables. In other words, FEVD serves to measure the proportion of other variables in explaining the variability of endogenous variables used in research.

Table 13.

The Forecast Error Variance Decomposition Analysis Result

Period	Misery Index				Interest Rate			
	MI	IR	LN_MS	LN_EXR	MI	IR	LN_MS	LN_EXR
4	63.45552	14.86867	10.59481	11.08100	10.07081	88.08942	1.799439	0.040331
8	36.81732	27.11417	25.27447	10.79403	9.108778	83.39995	6.516461	0.974806
12	33.99538	28.54512	27.62395	9.835546	7.539782	80.91795	9.963058	1.579207
16	32.90793	31.05815	27.16237	8.871546	6.157184	83.27896	8.749673	1.814181
20	31.74218	31.99021	28.46715	7.800455	5.692052	84.84592	7.910644	1.551387
24	30.96717	31.86958	30.11913	7.044116	5.338915	85.11716	8.132896	1.411031
28	30.09244	32.34389	31.17377	6.389890	4.844323	85.73266	8.109538	1.313481
32	29.47928	32.64653	31.99089	5.883305	4.497806	86.32909	7.959745	1.213355
36	29.10472	32.76956	32.68207	5.443658	4.230571	86.75040	7.869050	1.149978
40	28.72970	32.88682	33.32940	5.054069	4.005067	87.13430	7.774355	1.086281
Period	Money Supply				Exchange Rate			
	MI	IR	LN_MS	LN_EXR	MI	IR	LN_MS	LN_EXR
4	4.412859	2.319063	56.37435	36.89373	14.05572	4.914970	1.200905	79.82841
8	4.842697	28.99985	46.10227	20.05518	12.49744	22.05835	3.850581	61.59363
12	6.662819	36.14855	44.23566	12.95297	11.12280	26.18503	3.740903	58.95127
16	8.511888	37.85509	45.28622	8.346806	9.242078	34.82773	3.754428	52.17576
20	9.026504	39.39825	45.13022	6.445019	7.956144	43.33988	3.954969	44.74900
24	9.364655	39.67647	45.35770	5.601182	7.149269	47.95430	4.477738	40.41870
28	9.662504	40.11623	45.10463	5.116636	6.485453	52.47140	4.748767	36.29438
32	10.01573	40.39181	44.67310	4.919353	6.160824	56.06227	5.064316	32.71259
36	10.28823	40.40461	44.50655	4.800603	5.909900	58.63277	5.515207	29.94213
40	10.46022	40.45442	44.37851	4.706845	5.681810	60.85460	5.864926	27.59867

Source: Authors' Own

Based on Table 13 in the misery index section, the proportion of the influence of the misery index by the misery index itself has always decreased from year one to tenth year. The largest influence occurs in the first year, which the proportion is 63.45%, and the smallest influence occurs in the tenth year. which the proportion is only 28.72%. While the Interest Rate Variable provides an influence that increases steadily from the first to the tenth year. The largest influence occurred in the tenth year, which the proportion was 32.88%, and the smallest influence occurred in the first year, which the proportion was 14.86%. Likewise, the money supply variable provides an influence that increases steadily from year one to tenth year. The largest influence occurs in the tenth year, which the proportion is 33.32%, and the smallest influence occurs in year one, which the proportion is 10.59%. in contrast to the exchange rate variable, which provides

a decreasing influence steadily starting in year one to tenth year. The largest influence occurs in year one, which the proportion is 11.08%, and the smallest influence occurs in the third year, which the proportion is 5.05%.

In the interest rate section, the proportion of influence given by other variables makes the interest rate experience fluctuating changes, and only the misery index variable has a stable influence from year one to tenth year. The misery index variable provides the greatest influence in the first year, which the proportion is 11.15%, and the smallest influence occurs in the tenth year, which the proportion is 4%. The interest rate variable has the largest effect in the first year, which the proportion is 88.08%, and the smallest effect occurs in the third year, which the proportion is 80.91%. The money supply variable has the largest effect in the third year, which the proportion is 9.96%, and the smallest effect occurs in the first year, which the proportion is 1.79%. The exchange rate variable has the largest effect in the fourth year, which the proportion is 1.81%, and the smallest effect occurs in the first year, which the proportion is 0.04%.

In the money supply section, the proportion of the influence of the misery index always increases from year one to tenth year. The largest influence occurs in the tenth year, which the proportion is 10.46%, and the smallest influence occurs in the first year, which the proportion is only 4.41%. Likewise, the proportion of the influence of the interest rate is always increasing. The biggest influence occurs in the tenth year, which the proportion is 2.31%, and the smallest influence occurs in the first year, which the proportion is only 40.45%. In contrast to the previous results, the proportion of money supply has decreased from the first year to the tenth year. The biggest influence occurred in the first year, which the proportion was 56.37%, and the smallest influence occurred in the tenth year, which the proportion was only 44.37%. Likewise, the effect of the exchange rate is always decreasing. The largest influence occurred in the first year, where the proportion was 36.89%, and the smallest influence occurred in the tenth year, which the proportion was only 4.7%.

In the exchange rate section, the proportion of the influence of the misery index always decreases from the first year to the tenth year. The largest influence occurs in the first year, with a proportion of 14.05%, and the smallest influence occurs in the tenth year, with a proportion of only 5.68%. Unlike the previous result, the proportion of interest rates has increased from the first year to the tenth year. The largest influence occurs in the tenth year, with a proportion of 60.85%, and the smallest influence occurs in the first year, with a proportion of 4.91%. Likewise, the influence of the money supply is always increasing. The largest influence occurred in the tenth year, when the proportion amounted to 5.86%, and the smallest influence occurred in the first year, with a proportion of 1.2%. In contrast, the proportion given by the exchange rate has always decreased from the first year to the tenth year. The largest influence occurred in the first year, with a proportion of 79.82%, and the smallest influence occurred in the tenth year, with a proportion of 27.59%.

VECM Forecasting

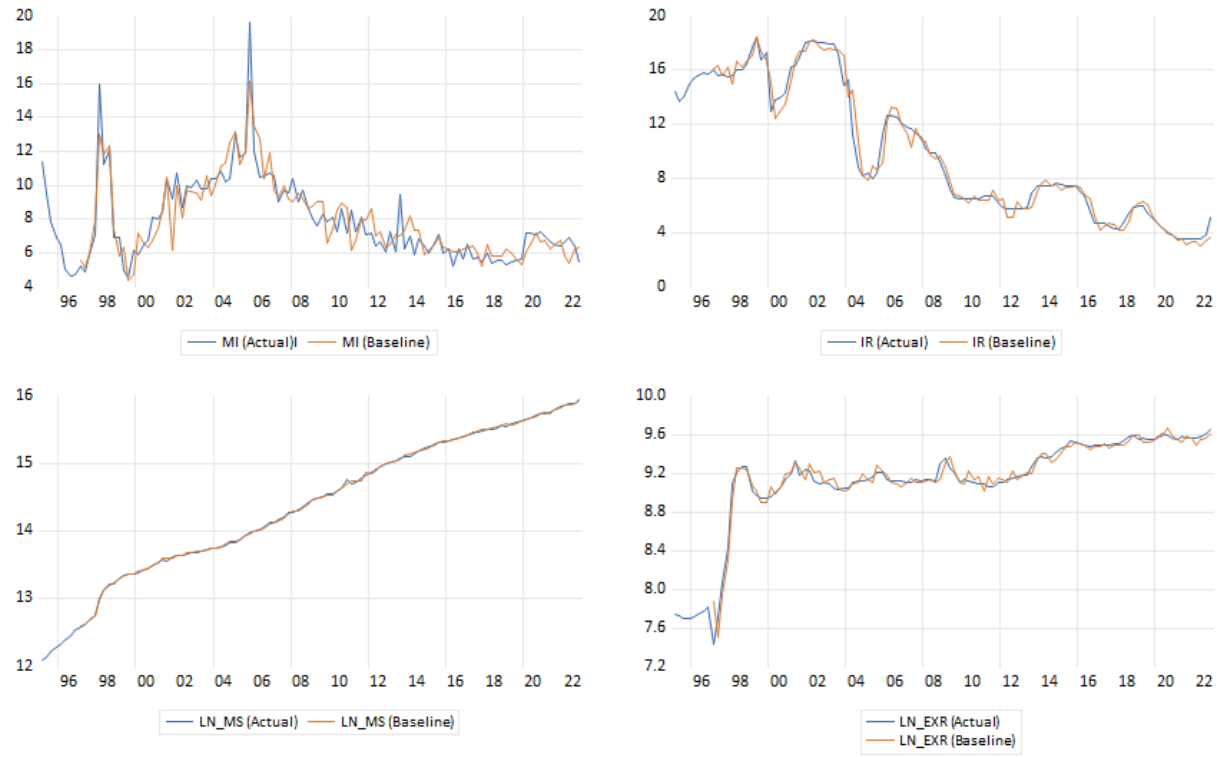

Figure 3. VECM Forecast
Source: Authors' Own

Figure 3 shows the forecasting results on the Misery Index, Interest Rate, Money Supply, and Exchange Rate variables based on the VECM model. Misery index variable forecasting results show that it will experience a higher increase than the actual misery index. Furthermore, the results of forecasting the interest rate variable show different results from the misery index, where the result is that the interest rate will experience a lower increase compared to the actual interest rate. Then the results of forecasting the money supply variable show that it will experience the same increase as the actual money supply. The last is the result of forecasting the exchange rate variable, which shows that it will experience a lower increase compared to the actual exchange rate

Discussion

The results of this study reveal that monetary variables such as interest rates, money supply, and exchange rates exert both short and long-term influences on misery index in Indonesia, reflecting their integral role in shaping macroeconomic stability and social welfare. The existence of cointegration among these variables indicates a stable long-run equilibrium, suggesting that fluctuations in monetary conditions are not transitory but have enduring implications for economic well-being. This finding reinforces the monetary transmission mechanism theory, which posits that monetary policy affects aggregate demand through channels such as interest rates, credit, and exchange rates, ultimately influencing inflation and unemployment (Bernanke & Gertler, 1995; Mishkin & Serletis, 2020).

In the long run, the strong effect of money supply growth aligns with Friedman (1968) monetarist perspective that excessive liquidity fuels inflation without generating sustainable employment, thereby eroding real income and deepening economic distress. This dynamic is characteristic of many emerging economies, including Indonesia, where structural rigidities in labor and production markets constrain the real-sector impact of monetary expansion. As a result, inflationary pressures persist even when output growth slows, illustrating a modified Phillips Curve relationship where inflation and unemployment can rise simultaneously (Blanchard & Johnson, 2012).

The short-term dynamics further highlight that monetary shocks, especially exchange rate volatility, play a decisive role in driving inflation and welfare outcomes. Exchange rate depreciation tends to transmit inflation through higher import prices and production costs, validating the exchange rate pass-through hypothesis (Bahmani-oskooee & Hajilee, 2013). The bidirectional causality between interest rates and the misery index also suggests an adaptive policy feedback mechanism consistent with the Taylor Rule (Taylor, 1993), where central banks respond to deteriorating welfare conditions by adjusting policy rates to balance inflation control and employment objectives.

Interest rate movements have notable implications for the real economy. As observed by (Feldman, 2013) and (Swastika et al., 2016) Higher interest rates dampen investment and consumption, leading to slower job creation and higher unemployment. When monetary tightening reduces real-sector investment, households often shift savings toward deposits, exacerbating unemployment issues (Effiong et al., 2022). However, stable interest rate policies remain essential to control inflation, as Cioran (2014) emphasizes, effective monetary frameworks that stabilize inflation can enhance employment prospects and economic confidence.

Regarding money supply, this study aligns with Ugondah & Adindu (2021) and Alhamdany & Obaid (2020), who find that moderate increases in money supply can stimulate output and employment through higher consumption and production. Nevertheless, when liquidity growth outpaces production, inflationary pressures dominate, worsening the misery index (Okoi et al., 2018). Similarly, the exchange rate plays a dual role: while depreciation can promote exports, stimulate output, and generate employment, excessive volatility undermines purchasing power and investor confidence (Atya, 2017; Lopez, 2022). As Frenkel & Ros (2006) explain, depreciation induced export growth may reduce unemployment, yet if inflation expectations rise, welfare improvements become temporary.

From a comparative perspective, these findings align with broader evidence from developing economies, where monetary instability magnifies social welfare losses (Aisen & José, 2008). In Indonesia, the misery index serves as a more comprehensive welfare metric, combining inflation and unemployment effects into a single indicator of economic discomfort. The country's dependence on imported commodities, limited industrial diversification, and relatively shallow financial markets heighten its

sensitivity to monetary disturbances. Hence, policymakers must design countercyclical and inclusive monetary strategies that stabilize prices while fostering productive employment, ensuring that monetary policy contributes not only to macroeconomic equilibrium but also to broader social welfare objectives.

CONCLUSION

This study analyzes the relationship between monetary variables and the misery index in Indonesia using the VECM model. The data are non-stationary at the level but become stationary at the first difference, and a cointegration relationship exists among the variables. The optimal lag length identified is seven. The VECM estimation results reveal both long-term and short-term relationships between monetary variables, interest rates, money supply, exchange rates, and the misery index. In the forecasting section, shocks from monetary variables are shown to have significant effects on the misery index, as confirmed by the impulse response analysis. These findings are further supported by the Granger causality test, which indicates causal relationships among most variables. The variance decomposition results show that the money supply variable contributes the most to changes in the misery index.

This study implies that monetary policy plays a crucial role in influencing the misery index. Therefore, maintaining monetary stability is essential to control inflation and unemployment, which are key goals of sustainable economic development. In practice, these findings suggest that central banks and policymakers must prioritize monetary stability, particularly by managing money supply growth and stabilizing exchange rates to mitigate inflationary pressures and unemployment simultaneously. A proactive and well-coordinated monetary strategy is essential to protect household welfare and sustain economic resilience. For future research, scholars are encouraged to employ more recent and comprehensive datasets, consider additional macroeconomic or institutional variables, and apply alternative econometric models such as ARDL or SVAR to validate and expand upon these findings. Comparative studies across countries could also provide broader insights into how different monetary regimes affect economic welfare as reflected by the misery index.

REFERENCES

Aisen, A., & José, F. (2008). Political instability and inflation volatility. *Public Choice*, *135*. https://doi.org/10.1007/s11127-007-9254-x

Alhamdany, S. N., & Obaid, M. K. (2020). Money Supply and Its Effect on Unemployment An Analytical Study in the Iraqi Economy for the Periode (2014-2019). *International Journal of Pshychosocoial Rehabilitation*, *24*(3), 4932–4944.

Atya, E. M. (2017). The Effect of Real Exchange on Unemployment Evidence from Egypt. *Arab Journal of Administration*, *37*(4).

Bahmani-oskooee, M., & Hajilee, M. (2013). Research in Economics Exchange rate volatility and its impact on domestic investment. *Research in Economics*, *67*(1), 1–12. https://doi.org/10.1016/j.rie.2012.08.002

Bank Indonesia. (2013). *Economic Report on Indonesia*.

Bank Indonesia. (2020). *Economic Report on Indonesia*.

Bank Indonesia. (2023). *Data Inflasi*. Www.Bi.Go.Id. https://www.bi.go.id/id/statistik/indikator/data-inflasi.aspx

Bernanke, B. S., & Gertler, M. (1995). Inside the Black Box: The Credit Channel of Monetary Policy Transmission. *Journal of Economic Perspective*, *9*(4).

Blanchard, O., & Johnson, D. R. (2012). *Macroeconomics* (6th ed.). Pearson.

Cioran, Z. (2014). Monetary Policy, Inflation and the Causal Relation between the Inflation Rate and Some of the Macroeconomic Variables. *Procedia Economics and Finance*, *16*(May), 391–401. https://doi.org/10.1016/s2212-5671(14)00818-1

Cohen, I. K., Ferretti, F., & Mcintosh, B. (2014). Decomposing the misery index : A dynamic approach. *Cogent Economics & Finance*, *2*. https://doi.org/10.1080/23322039.2014.991089

Effiong, U., Okon, J. I., & Arinze, N. P. (2022). The Exasperating Economic Misery in Nigeria : Can we Depend on Monetary The Exasperating Economic Misery in Nigeria : Can we Depend on Monetary Policy ? *International Journal of Business Management and Finance Research*, *5*(2), 67–84. https://doi.org/10.53935/26415313.v5i2.230

Feldman, H. (2013). Real Interest Rate and Labor Market Performance Around the Worl. *Southern Economic Journal*, *79*(3), 659–679.

Frenkel, R., & Ros, J. (2006). Unemployment and the Real Exchange Rate in Latin America. *World Development*, *34*(4).

Friedman, M. (1968). The Role of Monetary Policy. *The American Economic Review*, *58*(2), 1–17. https://doi.org/10.4324/9781912281091

Gujarati, D. (2015). *Econometrics by Example* (2nd ed.). Palgrave.

Lopez, F. S. (2022). Measuring the Effect of the Misery Index on International Tourist Departures : Empirical Evidence from Mexico. *Economies*, *10*(81), 1–16. https://doi.org/https:// doi.org/10.3390/economies10040081

Madurapperuma, W. (2023). Money Supply, Inflation and Economic Growth of Sri Lanka: Co-Integration and Causality Analysis. *Journal of Money and Business*.

Mankiw, N. G. (2016). *Macroeconomics* (9th ed.). Worth Publishers.

Mishkin, F. S., & Serletis, A. (2020). *The Economics of Money, Banking and Financial Markets* (7th ed.). Pearson.

Nopirin. (1987). *Ekonomi Moneter buku 2* (1st ed.). BPFE Yogyakarta.

Okoi, M., Ahmed, I., & Georgina, N. (2018). Money Supply and Inflation in a Growing Economy : the Nigerian Experience. *Wajmei*, *18*(2).

Selim, M., & Hassan, M. K. (2019). Interest-free monetary policy and its impact on in fl ation and unemployment rates. *ISRA International Journal of Islamic Financ*, *11*(1), 46–61. https://doi.org/10.1108/IJIF-06-2018-0065

Swastika, Putri, Masih, & Mansur. (2016). *Do Interest Rate and Inflation Affect Unemployment? Evidence from Australia* (10067).

Taylor, J. B. (1993). Discretion practice versus policy rules in. *Carnegie-Rochester Conference Series on Public Policy*, *39*. https://doi.org/https://doi.org/10.1016/0167-2231(93)90009-L

Ugondah, N. C., & Adindu, A. A. (2021). Macroeconomic policies and misery index in Nigeria. *International Journal of Multidisciplinary Research and Development*, *8*(7), 24–33.

Wang, N., Haroon Shah, M., Ali, K., Abbas, S., & Ullah, S. (2019). Financial Structure, Misery Index, and Economic Growth: Time Series Empirics from Pakistan. *Journal of Risk and Financial Management*, *12*(2), 100. https://doi.org/10.3390/jrfm12020100

Warjiyo, P., & Solikin. (2003). *Kebijakan Moneter di Indonesia* (6th ed.). Pusat Pendidikan

dan Studi Kebanksentralan (PPSK) Bank Indonesia.