Research article

Unraveling the Dynamic Impact of Money Supply, Interest Rates, and Corruption on Inflation: Evidence from Indonesia

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Abstract: This study investigates the impact of money, interest rates, and corruption on inflation in Indonesia. This data was obtained from Transparency International and the World Bank from 1995 to 2022. The Auto Regressive Distributed Lag (ARDL) model will be utilized as the estimation method. These findings reveal significant long-term relationships between the variables studied. In the long run, inflation in Indonesia is largely determined by corruption, interest rates, and the money supply. Apart from that, this significant influence is also found in short-term estimation results with different relationships. A decrease in CPI (high corruption) increases the inflation rate significantly, and vice versa. This demonstrates how crucial it is to set up strategies and policies to keep the inflation rate stable for a sustainable economy that doesn't just rely on financial tools but also lessens the likelihood of government-caused corruption and sources of income.

Keywords: inflation, corruption, interest rate, money supply, ARDL.

JEL Classification: E31

Abstrak: Studi ini menyelidiki dampak uang, suku bunga, dan korupsi terhadap inflasi di Indonesia. Data ini diperoleh dari Transparency International dan World Bank selama periode 1995-2022. Model Auto Regressive Distributed Lag (ARDL) akan digunakan sebagai metode estimasi. Temuan ini mengungkapkan hubungan jangka panjang yang signifikan antara variabel-variabel yang diteliti. Dalam jangka panjang, inflasi di Indonesia sangat ditentukan oleh korupsi, suku bunga, dan jumlah uang beredar. Selain itu, pengaruh signifikan ini juga terdapat pada hasil estimasi jangka pendek dengan hubungan yang berbeda-beda. Penurunan CPI (korupsi tinggi) akan meningkatkan tingkat inflasi secara signifikan, begitu pula sebaliknya. Hal ini menunjukkan betapa pentingnya menetapkan strategi dan kebijakan untuk menjaga tingkat inflasi tetap stabil demi perekonomian berkelanjutan yang tidak hanya bergantung pada instrumen keuangan namun juga mengurangi kemungkinan korupsi dan sumber pendapatan yang disebabkan oleh pemerintah..

Kata Kunci: inflasi, korupsi, suku bunga, jumlah uang beredar, ARDL.

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1. INTRODUCTION

Price stability has always been a subject of major concern for policymakers, practitioners, and researchers owing to its important implications for the overall growth of an economy (Ayodeji, 2020). Most wealthy nations aim towards 2% inflation, while double-digit inflation has calamitous micro and macroeconomic consequences that hurt consumers purchasing power and economic

growth (Inim et al., 2020; Mbagwu, 2023). Two theories have been set forth to explain inflation in developing countries: the monetarists and structuralists. Monetarists represented by Milton Friedman and his followers think of inflation as a purely monetary phenomenon that can only be created by expanding the money supply at a faster rate than the growth of capacity output (Altaee et al., 2019). The increase or decrease in the average price level can be caused by money growth.

Meanwhile, the structuralist theory tells about inflation in which the composition of demand for the production of goods and services is accompanied by inflexibilities in the productive structure of the economy (Altaee et al., 2019). It suggests that inflation is not only caused by aggregate demand and supply but also can be affected by social-political constraint and corruption in the short-run and long-run mostly for developing countries (Adayleh, 2018; Islam et al., 2022; Smauel et al., 2019). The common feature is that corruption tends to impose and constitute a "tax" on society, where gains are privatized by the local and global corruption networks and losses from corruption schemes are shared to different degrees by the rest of the society. Corruption deeply affects a country's quest to achieve an inclusive, equitable, and sustainable economy as well as political and social development (Gouvea et al., 2019).

The theory of optimal taxation describes how corruption may impact inflation (Ali & Sassi, 2015). According to this theory, governments are generally prone to use their supremacy to print money and create inflation as a source of governmental income. This seigniorage could be more important in a country experiencing significant tax evasion. Tax evasion and tax collection costs are generally higher in the most corrupt countries that will therefore know more about inflation. Moreover, corruption reduces efficiency by preventing the efficient distribution of economic and public resources. The transfer of these resources from productive fields to less controllable and manipulated projects negatively affects financial performance. This efficiency loss in public space reflects negatively on the private sector after some time and decreases economic performance. To cover the costs (which increase due to corruption), domestic and foreign borrowing is applied, which in turn increases inflation rates and the risk level of the country. This process has a direct deterrent effect on foreign investors and leads to an increase in exchange rates and current account deficit problems. As a result of this vicious circle, the increase in the volume of emission to cover the costs also triggers inflationist pressures (Özşahin & Üçler, 2017).

Sassi & Gasmi (2017) add that there are four channels through which corruption affects inflation. First, corruption increases the inflation tax and shrinks the tax base by pushing companies to operate in the informal sector and leading to capital flight, which constrains the government to resort to seigniorage. Second, bribes are included in the selling price and lead to an increase in the general level of prices. Third, corruption induces inflationary forces through higher aggregate demand pressures because it reduces public funds and increases the budget deficit. Fourth, by decreasing public incomes, corruption leads governments to increase the volume of public debt, which results in a higher inflation rate.

As a developing economy, Indonesia still makes efforts to combat corruption and inflation. Indonesia is the 110 least corrupt nation out of 180 countries and 6th among ASEAN countries, according to the 2022 Corruption Perceptions Index (CPI) reported by Transparency International. CPI measures corruption in the public sector, which is accountable to the government on a scale of zero and is highly corrupt up to 100 very clean (Transparency International, 2023). The low Indonesia's value of corruption index indicates that Indonesia is perceived to be more corrupt compared to these countries and corruption itself can lead to price increases. According to Elkamel (2019b), the countries that have low inflation rates are associated with low corruption rates.

Number of past studies that were conducted in developed and developing countries have paid extensive attention in evaluating the effect of corruption on inflation. Sassi & Gasmi (2017) found that the corruption effect is persistent only in low–middle-income economies and its adverse effect on inflation is weaker in high-income economies. In a study by Özşahin & Üçler (2017), Elkamel (2019a), Elkamel (2019b), and Ayodeji (2020) had similar results that high corruption increased inflation rates. Peixoto et al. (2022) observed the relationship between corruption and inflation through agricultural prices.
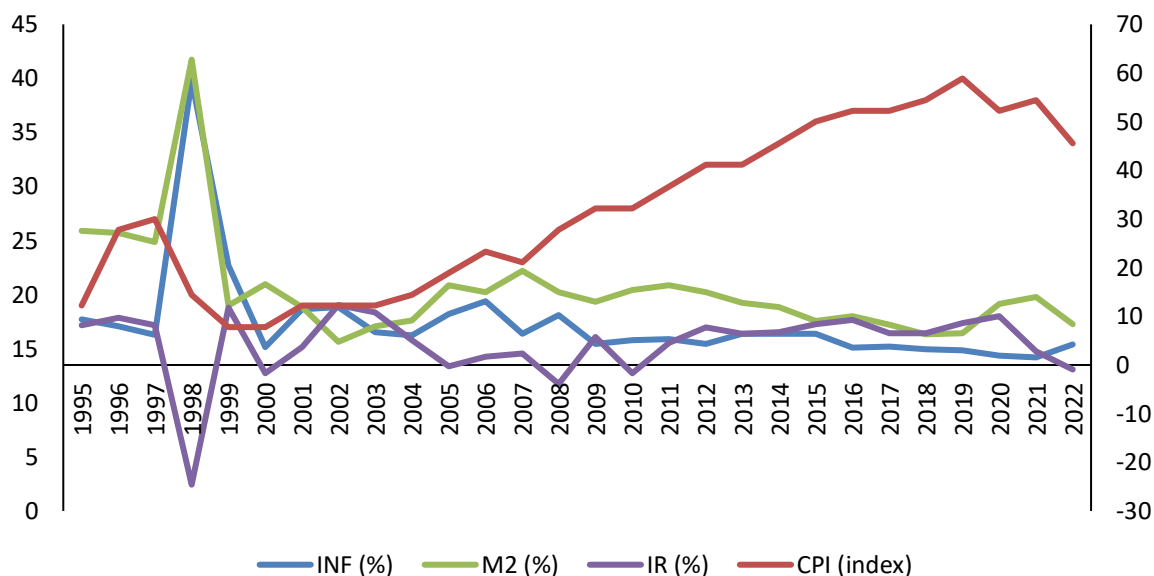
Figure 1. Corruption perception index, interest rate, money supply and inflation rate in Indonesia
Source: Transparency International (2023); World Bank (2023).

Few existing empirical studies on the corruption-inflation relationship looked at the connection between them in the case of Indonesia. Only one study by Elfrida & Oktaviani (2015) examined the effect of the Corruption Perception Index on macroeconomic fundamentals in Indonesia. This finding indicates that, both in the short and long-run, the Corruption Perception Index has no discernible impact on inflation. Unlike other literature, the paper investigates the impact relationship between corruption and inflation considering interest rate and money supply. The relationship between inflation and interest rate is found to exist using the Fisher effect as a framework (Adayleh, 2018; Firman & Munim, 2022; Amaefula, 2016; Egilsson, 2020; Tolasa et al., 2022). According to the quantity theory of Money proposed by monetarists distinguishes money supply as the prime cause of inflation (Adayleh, 2018; Altaee et al., 2019; Buthelezi, 2023; Inim et al., 2020; Islam et al., 2022; Mbagwu, 2023; Tolasa et al., 2022). Additionally, as far as we are aware, no Indonesian study has combined the inflation determinants by exploring the corruption using the Auto Regressive Distributed Lag (ARDL) model. Thus, this study brings new evidence on the impact of corruption, interest rate, and money supply on inflation in Indonesia in the long run and short-run relationship employing an ARDL technique, which many researchers have not researched yet. The rest of the study consists of four main sections, each providing a detailed overview of this study. The second section discusses the data and methodology and the empirical findings are evaluated in the third section. The fourth section concludes the paper.

2. RESEARCH METHODS

2.1. Data collection

This study uses time-series data in its analysis. The sample consists of annual secondary data from 1995 to 2022 sourced from Transparency International and the World Bank website. Inflation is measured as an annual percentage change in consumer prices, which was the dependent variable of the estimated long-term equation in the study. Inflation rate denoted by INF.

The Corruption Perception Index is used as a proxy for corruption as well as the key explanatory variable. This index has been used widely in the economics literature such as in research (Ali & Sassi, 2015; Ayodeji, 2020; Elkamel, 2019b, 2019a; Peixoto et al., 2022; Sassi & Gasmi, 2017). The CP Index is a measure of corruption in countries around the world, based on how corrupt their public sectors are perceived to be. At present, Transparency International boasts of indices for 180 countries and territories around the world based on 13 credible sources.

CPI covers a range of topics relevant to the public interest, such as the ability to reduce bribery, activate accountability mechanisms, monitor the use of public funds, reduce embezzlement of public money, and prevent officials from exploiting their positions for personal gain. It assesses the government's capacity to combat corruption, routine bureaucratic procedures that contribute to the increased likelihood of corruption, favoritism, and nepotism in government appointments, as well as the pursuit of corrupt individuals and the laws regulating such actions. It also addresses the protection of whistleblowers, journalists, and investigators when reporting corruption cases. The index evaluates the ability of civil society to access information of public concern, the civic space, the availability of accountability mechanisms for citizens, and the capacity to achieve justice and enforce the law. CPI does not measure tax evasion, money laundering, financial secrecy, illicit financial flows, or other forms of private sector corruption (Transparency International, 2021).

The results of this index are given on a scale of 0 to 100, where 0 represents most corrupt and 100 represents very clean/cleanest. Score close to 100 indicates more freedoms, access to information about public spending, stronger standards of integrity for public officials, and independent judicial systems. Scores below 50 are considered failing, possibly due to lack of government accountability and lack of oversight, while scores below 30 indicate severe systemic corruption that violates human rights, prevents sustainable development, and fuels social exclusion.

In addition, we include control variables that have been traditionally known to contribute to inflation. The exogenous variables in this study are interest rate (IR) and money supply (M2). Various studies on the relationship between interest rate, money supply, and inflation have evolved in literature. For instance, Adayleh (2018) study shows that the money supply has a positive and significant impact on inflation, while the interest rate has an adverse and significant effect on inflation. Similarly, Egilsson (2020) confirms the existence of cost-push effects and suggests that a persistent higher interest rate can evoke inflation. Amaefula (2016) found that interest rate does Granger cause inflation rate in the long run however, there exists weak evidence of Granger causal relation between the two variables in the short run. Alternatively, (Altaee et al., 2019; Inim et al., 2020; Islam et al., 2022; Mbagwu, 2023) use Auto Regressive Distributed Lag (ARDL) model in determining the association between money supply and inflation. Results of the analysis exhibited that a broad money supply has a significant and positive impact on inflation in the long run. However, Tolasa et al. (2022) found that there is a positive relationship between lending interest rate and inflation in the long run as well a broad money supply was found to be the dominant source of inflation in the short-run and long run with positive signs, but not significant. The detailed descriptions of all variables are given in Table 1.

Table 1. Description of variables and sources

Abbreviation	Variables	Explanation	Data source
INF	Inflation rate	Inflation with consumer prices (annual %)	The World Bank
CPI	the Corruption Perception Index	An index that ranks countries by their perceived levels of public sector corruption. The values range from 0 (most corrupt) to 100 (least corrupt).	Transparency International
IR	Interest rate	Real interest rate (annual %)	The World Bank
M2	Money supply	Broad money growth (annual %)	The World Bank

Source: Transparency International (2023); World Bank (2023).

2.2. Model spesification

We employ the recently developed Auto Regressive Distributed Lag (ARDL) model. The ARDL technique implies a single concentrated form of the equation whether the regressors should be a mixture of at level, I(0) and first difference, I(1) or purely I(0) or purely I(1), nevertheless, ARDL cannot be applied if variables are I(2). Otherwise, the model will lead the spurious results. The ARDL estimation techniques are well known to run with small sample sizes (i.e. 30–80 observations) for

more robust and consistent results. It also allows for the variables to have different optimal lags, which does not apply to other techniques. Lastly, the technique employs a single reduced-form equation for determining both long and short-run relationships among variables. Previous studies which investigate inflation have also relied on this model such as (Altaee et al., 2019; Inim et al., 2020; Islam et al., 2022; Mbagwu, 2023; Tolasa et al., 2022).

However, since time series data is used, stationarity of the variables and co-integration among the variables are tested prior to estimation using ADRL. To establish stationarity, the unit root test employing the Phillips–Perron (PP) test was conducted in the study. The test regression for the PP-tests is,

$$\Delta y_t = \mu_1 + \mu_2 t + \varphi y_{t-1} + \varepsilon_t \tag{1}$$

where, y_t is the series; ε_t is the error term; the equation is used for the null hypothesis: $H_0: \rho = 0$ (unit root); and the alternative hypothesis: $H_1: \rho < 0$ (series is stationary)

To examine the co-integration among the variables stated in Equation (1), we formulate the ARDL framework as follows:

$$\Delta INF_t = \beta_0 + \sum_{i=1}^{k} \beta_1 \Delta INF_{t-i} + \sum_{i=1}^{k} \beta_2 \Delta CPI_{1t-i} + \sum_{i=1}^{k} \beta_3 \Delta IR_{2t-i} + \sum_{i=1}^{k} \beta_4 \Delta M2_{3t-i} +$$
$$\theta_1 INF_{t-i} + \theta_2 CPI_{1t-i} + \theta_3 IR_{2t-i} + \theta_3 M2_{3t-i} + \varepsilon_t \tag{2}$$

Hence, INF; CPI; IR; and M2 are as earlier defined. Δ represents the first difference operator; β_0 is the constant term; and β_1,…., β_4 represent the short-run coefficients, θ_1, …, θ_4 are the long-run coefficients, k is the lag length, i is the lag order and εt represents the white noise error term.

To find out whether there exists a co-integrating relationship among INF, CPI, IR, and M2 in the long run, we test the null that $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ and the alternate hypothesis $H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$, by calculating the F-test developed by Pesaran, Shin, & Smith (2001). The calculated F-statistics value is compared with upper and lower critical values which are given by (Pesaran et al., 2001). If the calculated F-test is higher than the upper critical value, then the null hypothesis of no co-integration will be rejected whether or not the variables are *I*(0) or *I*(1).

According to Pesaran et al. (2001), to establish the existence of co-integration among the variables, we proceeded to estimate the Error Correction Model. The error correction model (ECM) representation of the ARDL approach is as follows:

$$\Delta INF_t = \beta_0 + \sum_{i=1}^{k} \beta_1 \Delta INF_{t-i} + \sum_{i=1}^{k} \beta_2 \Delta CPI_{1t-i} + \sum_{i=1}^{k} \beta_3 \Delta IR_{2t-i} + \sum_{i=1}^{k} \beta_4 \Delta M2_{3t-i} +$$
$$\delta ECT_{t-1} + \varepsilon_t \tag{3}$$

The essence of the error correction model is to show the speed of adjustment back to long-run equilibrium after a short-run shock. To ensure the goodness of fit of the model, we conduct several diagnostic tests. Specifically, these tests examined the serial correlation, normality, and heteroscedasticity associated with the selected model. Pesaran et al. (2001) suggest applying the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests to assess the parameter constancy. The tests are updated recursively and plotted against the breakpoints. If the plot lies within the critical bounds of level of significance at 5%, then the null hypothesis of all coefficients in the given regression is stable and cannot be rejected.

3. RESULTS AND DISCUSSION

3.1. Results

Statistical analysis usually begins with data description. The descriptive statistics are reported in Table 2. The average inflation rate (INF) for the sampled period is around 8.651 percent, with a maximum value of 58.45 and minimum of 1.560 percent, respectively. The Indonesian economy experienced its highest INF in 1998, while the lowest was seen in 2021. The value of INF is the standard deviation of the inflation rate, which is 10.564. The CPI is 27.821 on average. The maximum value of CPI is 40 for the year 2019, while the minimum value of this index, 17, is observed for the year 1999 and 2000. Similarly, the mean of interest rate (IR) is 4.430. The maximum (12.322) and minimum (-24.600) values of interest rate are recorded for the year 2002 and 1998, respectively. Finally, broad money (M2) in the economy are 15.36 percent on average. The highest and lowest M2 in the Indonesian economy were observed in 1998 and 2002, respectively. The maximum value is 62.763 percent, while the minimum value is 4.758 percent.

Table 2. Summary statistics of research variables

Statistic	INF	CPI	IR	M2
Mean	8.651	27.821	4.430	15.361
Maximum	58.451	40.000	12.322	62.763
Minimum	1.560	17.000	-24.600	4.758
Std. Dev.	10.564	7.548	7.162	10.956
Observations	28	28	28	28

Source: Author's Calculation (2023).

Table 3 reports the empirical results of stationary testing with Phillips-Perron (PP). According to this, all variables are stationary either in $I(0)$ and $I(1)$ at 1% and 5% significant levels, but none is I(2), and hence, the ARDL model is suitable for estimating purposes.

Table 3. The result of the Unit Roots test with Phillips-Perron (PP)

Variable	PP statistics				Decision
	At Level	**Prob. value**	**First Difference**	**Prob. value**	
INF	-3.956***	0.005	-	-	$I(0)$
CPI	-1.134	0.687	-4.610***	0.001	$I(1)$
IR	-5.670***	0.000	-	-	$I(0)$
M2	-3.644**	0.011	-	-	$I(0)$

Note: ***, **, and * indicate significance level at 1%, 5%, and 10%
Source: Author's Calculation (2023).

After examining unit root properties, the ARDL bound testing approach for co-integration was used to test the existence of the long-run relationship among the variables in the equation. We use the method Wald-coefficient test or F-test to determine the long-run level relationship between the variables.

Table 4. The result of ARDL co-integration

F-statistics: 36.930***	Critical Values		Decision
	Lower Bound	**Upper Bound**	
1% significance level	4.29	5.61	
5% significance level	3.23	4.35	Co-integrated
10% significance level	2.72	3.77	

Note: ***, ** and * indicate significance level at 1%, 5%, and 10%
Source: Author's Calculation (2023).

The test results show the calculated F-statistics is 36.930 and significant, which is higher than lower bound I(0) and upper bound I(1) in 1, 5, and 10% significant levels specified by (Pesaran et al., 2001). Therefore, we can reject the null hypothesis, and accept hypothesis H1: that the variables included in the model are co-integrated and so the presence of the long-run relationship is confirmed. Therefore, the study results suggest that there is long-run co-integration among the variables.

As a result of the presence of co-integration among research variables, we proceed to the short and long-run, and the validity of estimated models of the effects of corruption, interest rate, and money on inflation in the sample country.

Table 5. Coefficients of short and long-run by the ARDL model and validity testing

Dependent Variable: INF				
Long-run estimation				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	9.394***	1.570	5.985	0.000
CPI	-0.425***	0.023	-18.698	0.000
IR	0.739***	0.107	6.935	0.000
M2	0.442***	0.082	5.376	0.000
Short-run estimation				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ(CPI)	-0.585**	0.222	-2.635	0.027
Δ(CPI(-1))	-1.326**	0.452	-2.931	0.017
Δ(CPI(-2))	1.188***	0.295	4.032	0.003
Δ(IR)	0.504**	0.164	3.070	0.013
Δ(IR(-1))	-0.234*	0.104	-2.260	0.050
Δ(IR(-2))	-0.740***	0.137	-5.409	0.000
Δ(IR(-3))	-0.280***	0.072	-3.883	0.004
Δ(M2)	-0.258**	0.110	-2.346	0.044
Δ(M2(-1))	-0.311**	0.113	-2.752	0.022
Δ(M2(-2))	-0.262***	0.067	-3.911	0.004
CointEq(-1)	-1.969***	0.229	-8.613	0.000
Diagnostic test	Stat. Value	*p-value*		
Normality	0.702	0.704		
Serial correlation	0.038	0.850		
Heteroscedasticity	0.372	0.548		

Note: ***, **, and * indicate significance level at 1%, 5%, and 10%
Source: Author's Calculation (2023).

The long-run results confirm the expected sign that CPI impacts inflation negatively in Indonesia since the coefficient of CPI, in the long run, is negative and statistically significant at a 1% significance level. In the long run, the results show that other things remain the same, a 1% decrease in the CPI leads to a 0,42% increase in inflation. However, the coefficients of IR and M2 are positive and significant. This means that a 1% increase in interest rate and money supply increases inflation by 0,73% and 0,44%, respectively.

Moreover, the empirical results in Table 5 reveal that in the short-run, most of the coefficients have the expected signs that can be seen on the coefficient of the CPI and IR is negative. The 1% decrease in corruption perception index (high corruption) increases the inflation rate significantly by 0,58% and 1,32%, respectively, in the short-run in Indonesia. The interest rate from the one-year lag up to the three-year lag of interest rate is negative and significant in explaining the inflation in the short-run unless inflation in the current year. If the interest rate in the previous year is on an upward trend, inflation in the following year will likely decrease by 0,23%, 0,74%, and 0,28%. Only the coefficient of M2 is not in line with the expectation.

The coefficient of the error correction term lagged one period (CointEq -1) is negative and significant at a 1% significance level indicating that CPI, IR, M2, and INF are co-integrated. The coefficient of error correction term ECM(-1) in absolute terms is 1.969. This means that about 196% of the deviation of the long-term inflation rate is corrected annually due to the adjustment from the short-run to the long run. This suggests that approximately 196% of disequilibrium in the previous year's inflation is corrected in the current year.

To corroborate the results, a diagnostic test was performed to evaluate serial correlation (serial correlation LM), normality, and heteroskedasticity in Table 5. Results show that some diagnostic tests, the familiarity of residual terms (Jarque-Bera), Lagrange Multiplier (LM) for serial correlation Breusch-Pagan-Godfrey and ARCH effects for heteroscedasticity reported recommended that the model goes through all analytical tests. Hereby, the findings represent that the model is valid and correct.
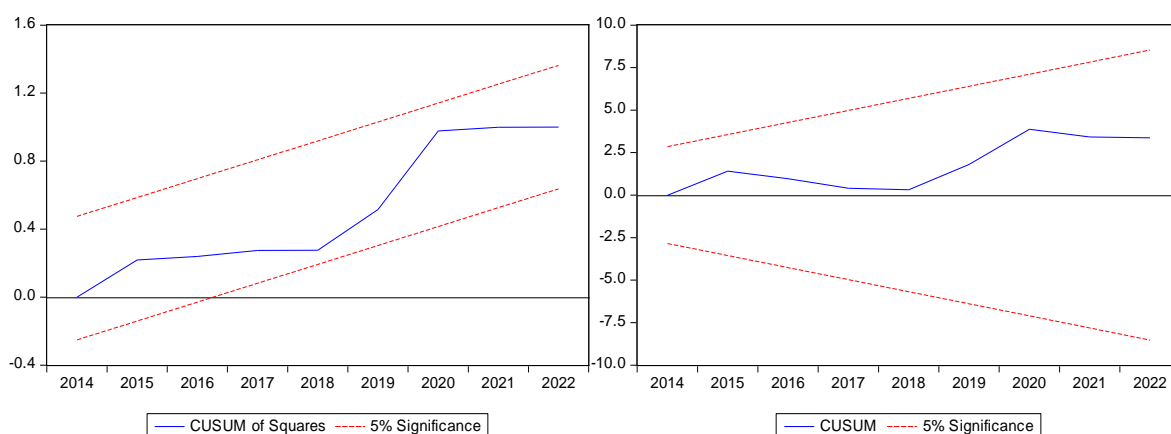

Figure. 2. Plot of CUSUM and CUSUMSQ Tests

Lastly, we checked the stability of the long-term parameters, along with the short-term movement to the equation using the CUSUM and CUSUMSQ tests. From Figure 2, it can be concluded that both the plots of CUSUM and CUSUMQ statistics stay within the critical boundaries; thus, we indicated that there is no evidence of any significant structural instability for our model.

3.2. Discussion

Conceptually, the effect of corruption on inflation is explained in terms of duration (time horizon). If corruption becomes permanent, it will give rise to high inflation. The main finding of the study is that the impact of CPI accounted for corruption is negative in the long- and short-run dynamics. This result follows prior expectations. The corruption could increase inflation on a greater level in a shorter period compared with the long-run impact (-0.585 vs. -0.425). This makes sense because the fight against corruption needs time to adjust to a better level; thus, corruption still high in short run.

This can be explained to mean that the corruption perception index uses a scale of 0 (highly corrupt) to 100 (very clean). Therefore, the lower value of index in a country, the higher corruption. Higher corruption is associated with the low value of corruption perception index and high inflation, vice versa. It may be linked to inflation, in which high levels of corruption in an economy could discourage productivity and investment. A less productive state is essentially a net importer of goods and services. This could lead to imported inflation. Corruption makes the government lose revenue, thereby making it difficult to finance public expenditures. Lack of efficiency in the taxation process is one of the reasons a government may strategically adopt inflation tax as a source of revenue. A country that cannot institute an efficient and sophisticated structure to retrieve taxes is liable to tax evasion and high tax collection costs; such a government may rely heavily on inflation tax to finance budget deficits (Ayodeji, 2020). Studies by (Ali & Sassi, 2015) also confirm this finding. In a corrupted environment with political instability and bad governance, countries display higher money supply and therefore higher inflation rates. Sassi & Gasmi (2017) find that in low–middle-income

economies, a positive shock on the CPI generates a decrease in the inflation rate, this result is consistent with the theory. Their suggestion was also supported by (Ahmed et al., 2018; Elkamel, 2019a, 2019b; Özşahin & Üçler, 2017).

In case of Indonesia, The World Economic Forum released data in 2016 that corruption is still a major problem for business people in Indonesia. Corruption forces business people to incur additional costs of an average of 10 percent to facilitate their business activities. This makes investors from abroad reluctant to invest their capital in this country because of a high cost economy to run a business in Indonesia. Meanwhile, small entrepreneurs are reluctant to compete. Consumers are also disadvantaged because the additional costs imposed will be passed on to consumers by increasing the price of goods (Prihatmanto et al., 2023; Margaryan & Terzyan, 2023).

We have seen massive corruption occurs in Indonesia. Based on data from Indonesia Corruption Watch (ICW), the amount of corruption increased by 8.63% from 533 cases to 579 cases in 2022. This causes the score Indonesia's Corruption Perceptions Index in 2022 decline very drastically, namely from 38 to 34, bringing the country nearly back to its 2012 rating (Sidiq & Wahyuni, 2024). The corrupt public official will tend to seek to 'hide' the damage caused to the state by asking for more public expenditure that will simultaneously help mask the inefficient performance and defend against the direct diversion of public money in favor of private benefits. Inflation due to aggregate demand mechanisms, in this case, the pressure on public spending feeds inflationary tensions (Peixoto et al., 2022). This finding implies that in the context of a developing economy, corruption could result in potential economic costs for Indonesia. Therefore, efforts to reduce inflation will be even more difficult if corruption is high.

In addition, the results reveal that interest rate has a significantly positive effect on inflation in the long run, but a negative effect in the short-run. This finding implies that interest rates could be used as a tool only for inflation reduction in the short-run. It can be explained that interest rate is the cost of borrowing or simply the price of money. When interest rates fall, people's interest in taking out loans becomes high. For business people, this will encourage economic development, which in turn will increase people's purchasing power. As a result, the demand for goods increases. Furthermore, the prices of goods in general will increase and result in inflation (Amaefula, 2016; Aprileven, 2017).

In the long run, interest rates raise inflation, this result is against the theory. This establishes that increased interest rates result in higher production costs and rising prices (inflation). Egilsson (2020) states that higher interest rates can discourage new investment, encourage saving, and consequently dampen output. If supply decreases, but demand remains, there will be a shortage of goods. As a result, there is an increase in prices, and then inflation occurs. A higher interest rate also affects funding costs, a factor of production potentially reflected in the price level when the magnitude of the funding cost increase is sufficiently large. It implies that excessive long-lasting interest rates can spark inflation (Egilsson, 2020). This result is similar to Amaefula (2016) confirmed a unidirectional Granger causality flow from interest rate to inflation rate in the long run. Tolasa et al. (2022) suggest that low financial development and less inclusiveness of the financial system in the country may also moderately elucidate the less importance of the monetary instrument to control inflation.

Finally, the results revealed a negative and statistically significant relationship between the money supply and inflation rate in the short-run, but it turned out to be positive in the long run. Regarding the negative impact of money supply on inflation rate in short-run, the examination result is in line with Buthelezi (2023), who found that an increase in M3 results in a 0.05% fall in the inflation rate. The result implies that the monetary tool of the money supply is effective in stabilizing prices when inflation is within the target, for instance, the range of inflation targeting is 3% to 6%.

The core inflation in Indonesia in 2023 remains stable in the range of 3% ± 1, namely 2.61 percent, showing that public demand is consistent with a more robust economic recovery. Some interventions from the local government through the Regional Inflation Control Team to reduce inflation, among others, are carried out through supply control, the provision of transportation subsidies, market operations, and community movements such as the fast-harvest food planting movement (Uddin & Rahman, 2023).

Money supply appeared to be one of the main driving forces behind increased inflation in the Indonesian economy in the long-run. Buthelezi (2023) said that monetary expansion has continued as the key contributing factor to the persistent increase in the price level. The stability of the overall price level will be impacted by the money supply. According to the quantity theory of money, the excessive growth of money supply will inevitably result in inflation. Inflation is a long-term rise in the general price level of goods and services in Keynesian theory. A rapid increase in the amount of money in the economy leads to a corresponding increase in productivity, which increases the overall demand for goods and services to meet current prices (Sola & Peter, 2013 in Mbagwu, 2023). Monetarists like Friedman (1963) cited by (Islam et al., 2022) agreed that inflation is a monetary phenomenon that comes from the excess demand for goods and services resulting from an excess supply of money. This result is in line with the conclusions of other authors such as (Adayleh, 2018; Inim et al., 2020; Tolasa et al., 2022).

4. CONCLUSIONS

In this study, the effects of corruption, interest rates, and money on inflation are examined for the period from 1995 to 2022. Using the ARDL model, we found long-run co-integration among the variables of interest. The research concluded that the corruption perception index has a significant negative impact on inflation in the long run and short-run. This finding supports the notion that corruption can increase inflation. The analysis demonstrates that corruption hurts inflation in a greater impact in the short-run as compared to the long run, highlighting the necessity for diversity in this phenomenon. Regarding practical implications, the results suggest that the Indonesian government should prioritize policies to combat corruption. By creating an effort to minimize corruption, such as implementing good governance, governments can prevent the adverse impact of corruption toward inflation for society.

On the monetary policy front, the positive relationship between interest rates and inflation in the long run indicates the need for policies that mitigate the cost of funding at higher interest rates. The study's findings also highlight the importance of controlling the quantity of money in circulation because the impact in the long run is about to increase inflation. In the short-run, the government should increase production to fulfill aggregate demand for goods and services. The expected signs of coefficients, overall, are straightforward.

Our work emphasizes the need to fight inflation in developing countries not only to focus on monetary variables but also consider to control nonmonetary variables such as corruption. Further studies are needed to examine the causality between corruption and inflation. Some researchers observed this causal effect (Ahmed et al., 2018; Özşahin & Üçler, 2017; Sassi & Gasmi, 2017) to obtain the comprehensive policy analyses of a single country. This study used a way relationship for analysis of Indonesian policy.

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