International Journal of Finance, Economics and Business
Vol. 3, No. 2, June 2024, pp.107-119
e-ISSN: 2948-3883
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DOI: 10.56225/ijfeb.v3i2.329

Original Article

Does Bank Credit Fluctuation Affect Inflation? Evidence from Indonesia

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Citations: Fitria, C.N., Silvia, V. and Seftarita, C. (2024). Does Bank Credit Fluctuation Affect Inflation? Evidence from Indonesia. *International Journal of Finance, Economics and Business*, *3*(2), 107-119.

Received: 12 February 2024 Revised: 2 May 2024 Accepted: 22 May 2024 Published: 30 June 2024

Abstract: Both developed and developing nations frequently encounter the economic challenges of inflation. Middle- and low-income developing countries generally experience higher inflation rates than their high-income developed counterparts. Interest rates influence the relationship between credit distribution and inflation. This study examines how fluctuations in bank lending affect inflation in Indonesia. Monthly data from 2016 to 2023 were analyzed using the Autoregressive Distributed Lag (ARDL) approach. The findings reveal that working capital loans significantly positively affect Indonesian inflation in both the short and long term. While investment credit shows no short-term impact on inflation, it significantly positively influences the long run. Consumptive credit exhibits a significant positive effect on inflation in the short term but a significant negative effect in the long term. The BI rate shows no short-term influence on inflation. However, it has a significantly negative impact in the long term. Based on these results, it is recommended that Bank Indonesia enhance its coordination of monetary stability, inflation control, and financial system improvements, particularly regarding interest rates. Additionally, banks acting as intermediaries should monitor the utilization of working capital, investments, and consumptive credit to help manage inflation in Indonesia.

Keywords: Inflation; Working capital credit; Investment credit; Consumptive credit; Bank Indonesia rate; Autoregressive Distributed Lag approach.

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1. Introduction

Inflation is an economic problem often faced by developed and developing countries. Compared to high-income developed countries, inflation rates are greater in middle- and low-income developing countries (Lisani et al., 2020). Inflation cases may not be able to reduce inflation by themselves. However, greater emphasis than inflation itself may eventually bring down inflation (Dubey & Mishra, 2023). Inflation targeting affects the monetary framework, so the central bank should be more assertive in maintaining public expectations by meeting the set inflation target (Bambe, 2023). Research conducted by Xu & Lien (2024) in 2019 around the world shows that the monetary policy response is running so fast that it will cause inflation fluctuations. However, research conducted by Garcia & Cross (2024) found that the increase in inflation focuses on reducing the impact of money inequality. The whole world, from 2008 to 2009,

experienced a financial crisis that caused banks to experience an increase in credit, and some of them even reduced lending (Coleman & Feler, 2015). Meanwhile, Borsi (2018) emphasizes that an increase in unemployment will lead to a decrease in credit. Furthermore, Katusiime (2018) adds to this by showing a positive correlation between investment credit growth and inflation volatility, implying that contractionary policies can exacerbate inflation problems. Any monetary institutions and financial systems around the world in developing countries tend to have a positive impact that can increase the cost of credit (Cavallino & Sandri, 2023). (Goodhart et al., 2023) in their research showed that financial extension financed by credit money for the non-bank sector will be able to increase yields but will have an impact on credit increases.

Loans are important to commercial banks' revenue streams, and the quality of loans directly impacts credit success (Yu, 2022). Several studies have been conducted on bank credit. Alamsyah et al. (2023), Anwar et al. (2023), Domonkos et al. (2023), and Fungacova et al. (2023). All of these studies examined bank credit according to its use, such as working capital credit, investment credit and consumer credit. However, all these studies also used interest rate indicators. In general, it shows that the impact of a decrease in credit on the inflation rate is smaller. However, suppose there is an increase in the amount of credit disbursed by the bank. In that case, it indicates the existence of a monetary policy transmission mechanism, especially in the bank lending channel.

According to the Bank Indonesia survey, a trend comparison of the amount of working capital loans, investment loans, and consumptive loans and total loans in Indonesia during the period 2016-2023 can be seen. In 2020, there were indications that there was a significant increase in demand for working capital loans amounting to Rp2,465 billion year-on-year, investment loans grew by Rp1,469 billion year-on-year and also increased, consumptive loans were recorded positively at Rp1,547 billion year-on-year and the total amount of the three loans amounted to Rp5,481 billion year-on-year. In 2021, the distribution of working capital loans began to experience a significant increase of IDR 2,621 billion year-on-year, greater than the distribution of investment loans, which amounted to IDR 1,528 billion year-on-year. The distribution of consumer loans is expected to grow by IDR 1,620 billion year-on-year, with the total amount of the three loans also increasing significantly by IDR 5,769 billion year-on-year compared to the previous year.

However, in 2022, working capital lending experienced a very significant increase of Rp2,940 billion year-on-year, which was greater than investment lending of Rp1,711 billion year-on-year and consumer lending is expected to grow by Rp1,772 billion year-on-year with the total amount of the three loans also increasing significantly by Rp6,423 billion year-on-year from the previous year. Then, in 2023, working capital lending again experienced a very significant increase of Rp3,236 billion year-on-year, greater than investment lending of Rp1,921 billion year-on-year and consumptive lending is expected to grow by Rp1,934 billion year-on-year, with the total amount of the three loans also increasing significantly by Rp7,091 billion year-on-year from the previous year.

One of the other components that affect the Bank Indonesia benchmark interest rate, or BI rate it, is more often known. BI rate is a measure of changes in inflation in Indonesia and can be used by banks to determine interest rates on deposits, including savings accounts, loans, and investment funds. Both deposit rates and bank lending rates will be impacted by changes in the BI rate (Rizky, 2020). By reducing the benchmark interest rate, Bank Indonesia can encourage economic growth through monetary policy. A decline in the BI rate will result in lower lending rates, which will raise credit demand and cause inflation to increase. On the other hand, if Bank Indonesia reacts by increasing the BI rate, it will increase lending rates so that credit demand will decrease, which can reduce inflation (Rizkina & Rizki, 2017).

Mayo et al. (2014), Taylor (2019), Astuti & Hastuti (2020), Rasyidin et al. (2022) and Emam (2024), the monetary policy transmission mechanism has a significant consideration in deciding the ultimate goal of monetary policy. It also impacts business and economic activity through several channels, including interest rate, asset price, credit, exchange rate, and inflation. All this research shows that monetary policy transmission through interest rates has a negative and significant effect on inflation. Bank Indonesia noted that in 2020, the total lending of commercial banks contracted by IDR was 5,481 trillion, and the BI rate contracted again by 3.75 percent. However, in 2021, the trend of total commercial bank lending expanded again by IDR 5,768 trillion, with the BI rate again contracting by 3.50 percent. Then, in 2022, the total distribution of commercial bank loans again expanded by IDR 6,423 trillion, with the BI rate again expanding by 5.50 percent. At the end of 2023, total commercial bank lending again experienced a very high expansion of Rp7,090 trillion with the BI rate finally expanding by 6.00 percent.

Therefore, an expansionary monetary policy can increase bank lending activity, called credit (Soedarmono et al., 2023). In addition, credit can play an important role as a specialist lender as a last resort for companies that need bank capital (Psillaki & Eleftheriou, 2015). In contrast to previous studies, such as research conducted by Koch & Islam (2024) and Thamae & Odhiambo (2024), said that rising interest rates

have a positive impact on credit risk but have a negative impact on capital risk, bank credit debt risk, and bankruptcy risk for banks. Activities to strengthen banking regulations must be carefully targeted and well-designed to maximize bank lending. However, research conducted by Sapriza & Temesvary (2024) in their research discusses when the economy is growing slowly, monetary policy works better through the bank credit channel to stimulate its activity implying that this channel becomes stronger with business loans than consumptive credit that this channel works through a wider variety of banks and credit loan categories.

So far, it can be described that based on the literature review, contradictory differences have been found in this study. Including research gaps from previous studies that have been tested and analyzed is useful. Therefore, researchers found new things in this consideration to analyze the impact of bank credit fluctuations in the short and long term. Even in this study, it will be described in general that the banking industry can distribute credit to people who need funds according to the portion and needs of the community itself. In the banking industry, there are several types of credit, including working capital, investment, and consumer credit.

Other instruments in lending in the banking industry affect interest rates and the money supply. However, this study only focuses on other credit instruments that affect interest rates or what is now known as the BI rate. If Bank Indonesia encourages an increase in lending rates, the number of loans banks provide will decrease. High lending rates will affect the amount of credit that can be disbursed, affecting various economic activities. In the end, it will also impact inflation in Indonesia. Specifically, this study will analyze the impact of fluctuations in bank credit on inflation in Indonesia in the short term and long term.

2. Materials and Methods

2.1. Materials

The data in this research is in the form of time series data collected occasionally. In this research, the data presented is in the form of monthly time series data for 2016 to 2023, so there are 96 data in this study. The time series data in this study is used to analyze the relationship bank credit provides to inflation in Indonesia. This research uses secondary data. Secondary data is data that already exists, has been processed by a party, and then made in the form of publications (Silvia, 2020). The data is collected from statistical publications of Bank Indonesia and the Central Statistics Agency. Inflation is the dependent variable, while working capital credit, investment credit, consumer credit and BI rate are independent variables. Inflation is a change in the increase in the price of goods and services nationally within a certain period, which is measured using units in the form of percentages. Working capital loans are commercial bank credit facilities used to finance business or business activities measured using units in the form of billions. An investment loan is a commercial bank credit facility used to increase the company's productivity, measured using units in the form of billions. Consumptive credit is a commercial bank credit facility used to carry out consumption activities measured using units in the form of billions. BI rate is a policy interest rate determined by Bank Indonesia, which is measured using units in the form of percentages.

2.2. Methods

This research uses the Autoregressive Distributed Lag (ARDL) model. Pesaran and Shin (1997), introduced the ARDL model approach. The Autoregressive Distributed Lag (ARDL) model uses one or more past data of the dependent variable among the explanatory variables. This research model uses current time data and past time data or time-lapse. This research will use the Autoregressive Distributed Lag (ARDL) method by completing the data stationarity test, cointegration test, short-term and long-term testing, model stability test and classical assumption test (Gujarati, 2021). The Autoregressive Distributed Lag (ARDL) model can distinguish between short-term and long-term reactions of the dependent variable to a unit change in the explanatory variable (Juaris et al., 2018). In general form, the ARDL equation (1) can be written as follows (Zaretta & Yovita, 2019):

$$\Delta Yt = \beta o + \sum_{i=1}^{n} \beta_1 \Delta y_{t-1} + \sum_{i=0}^{n} \delta_1 \Delta x_{t-1} + \varphi_1 y_{t-1} + \varphi_2 x_{t-1} + \mu t, \quad (1)$$

Meanwhile, based on previous research literature with a modified model from Silvia & Tyas (2014), Jamal et al. (2018), Machtra et al. (2023) and Suriani et al. (2023) to test the variables of working capital credit, investment credit, consumer credit, and BI rate on inflation. Based on equation (2) above, the ARDL equation model is as follows:

$$\Delta INF_{t-1} = \beta o + \sum_{t-1}^{p} \beta 1 \Delta INF_{t-1} + \sum_{t=1}^{p} \delta 2 \Delta KMK_{t-1} + \sum_{t=1}^{p} \delta\, 3 \Delta KI_{t-1} + \sum_{t=1}^{p} \delta 4 \Delta KK_{t-1} + \sum_{t=1}^{p} \delta 5 \Delta BR_{t-1} + \varphi 1 INF_{t-1} + \varphi 2 KMK_{t-1} + \varphi 3 KI_{t-1} + \varphi 4 KK_{t-1} + \varphi 5 BR_{t-1} + \varepsilon_t, \quad (1)$$

Where β^1,δ^1 are short run coefficients, $\varphi_{1,2}$ are long run ARDL coefficients, μ_t is disturbance error, INFt-i is Inflation, WCCt-i is working capital credit, ICt-i is investment credit, CCt-i is consumptive credit, BRt-i is BI Rate, βo is a constant, $\beta 1$, δ1, δ2, δ3, δ4, δ5, δ6 are short run coefficients, φ1, φ2, φ3, φ4, φ5, φ6 are long run coefficients and Ɛt is the error term.

3. Results

3.1. Descriptive Statistics

In this study, descriptive statistics are utilized to present data in terms of mean, median, highest and lowest values, standard deviation, and the number of observations for each variable. The study examines variables including working capital credit, investment credit, consumptive credit, BI rate, and inflation. This investigation employs monthly data spanning from 2016 to 2023. Table 1 displays the outcomes of the descriptive statistical analysis. As evidenced by Table 1, the descriptive statistics reveal that 96 observations were used for each variable in this study. The results of the descriptive statistics indicate an inflation rate of 4.086 percent with a median of 3.580 percent. The maximum and minimum inflation rates observed were 8.790 percent and 1.320 percent, respectively. The standard deviation of inflation, at 1.872 percent, suggests a relatively narrow data spread as it is lower than the mean value. Consequently, the data are evenly distributed with minimal deviation. The collected data on inflation in Indonesia demonstrate fluctuations and a consistent, favourable increase. The study sample comprised 96 observations of working capital loans. The mean value of working capital credit was 2144.412 billion rupiah, with a median of 2138.358 billion rupiah. Working capital credit exhibited a maximum of 3235.836 billion rupiah and a minimum of 1041.701 billion rupiah. The standard deviation of working capital credit, at 546.765 billion rupiah, is smaller than the mean value, indicating an even distribution of data with minimal deviation. Working capital loans have the potential to facilitate early repayments, thereby potentially mitigating inflation. However, the cost of meeting working capital requirements, often financed through credit, may contribute to inflationary pressures, particularly in developing economies.

Table 1. Descriptive Statistics Analysis (N=96)

Statistics	INF	WCC	IC	CC	BR
Mean	4.086	2144,412	1,187,492	1297,367	5.515
Median	3.580	2138,358	1178,537	1335,410	5.750
Maximum	8.790	3235,836	1920,752	1933,656	7.750
Minimum	1.320	1041,701	472,620	668,717	3.500
Std. Dev.	1.872	546,765	375,421	339,403	1.336

Note: INF: Inflation; WCC: Working Capital Credit; IC: Investment Credit; CC: Consumptive Credit; BR: BI Rate

Table 1 presents the descriptive statistical analysis results for investment credit based on 96 data samples. The mean is Rp1,187.49 billion, with a median of Rp1,178.53 billion. The maximum value is Rp1,920.75 billion, and the minimum is Rp472.62 billion. The standard deviation is Rp375.42 billion, indicating a small data deviation due to its size being smaller than the mean. Investment credit positively influences inflation, potentially reducing economic efficiency. In the case of consumptive credit, the analysis also utilizes 96 data samples, showing a mean of Rp1,297.36 billion and a median of Rp1,335.41 billion. The maximum value is Rp1,933.65 billion, and the minimum is Rp668.71 billion. The standard deviation is Rp339.40 billion, suggesting a small data deviation due to its smaller size than the mean. Consumptive credit can cause inflation but may also stimulate economic growth. The analysis of the BI rate includes 96 data samples, with a mean of 5.515 percent and a median of 5.750 percent. The maximum value is 7.750 percent, and the minimum is 3.500 percent. The standard deviation of 1.336 percent indicates a small data deviation as it is smaller than the mean. Research on the BI rate and inflation in Indonesia shows that the BI rate, money supply, and exchange rate significantly impact inflation. However, whether central bank independence ultimately reduces inflation remains to be seen.

3.2. Stationary Test

The unit root test was employed to assess the stationarity of the observed data. Statistical inferences are invalid if the variables are non-stationary or possess unit roots. Therefore, stationarity is a crucial prerequisite. Various methodologies exist for unit root testing; the Augmented Dickey-Fuller test was utilized in this study. As the ARDL technique does not apply to data that are non-stationary at second-order differencing, the initial step in conducting research with the ARDL technique is to determine whether the data are stationary at first-order or second-order differencing (Silvia et al., 2023). The results of the stationarity test are presented in Table 2 below:

Table 2. Result of Stationary Testing.

Variable(s)	Augmented Dickey-Fuller (ADF)			Decision
	Level (Prob.)	1st Difference (Prob.)	2nd Difference (Prob.)	
INF	0.2510	0.0000***	-	I(1)
WCC	0.9058	0.2246	0.0000***	I(2)
IC	0.5787	0.0000***	-	I(1)
CC	0.7345	0.0000***	-	I(1)
BR	0.4226	0.0000***	-	I(1)

3.3. Lag-Length Selection Criteria

The lag obtained for each model was subsequently applied to the ARDL estimation process. Determining data stability and the optimal lag in the VAR strategy is crucial for ensuring the reliability and accuracy of the analysis. After confirming that the data meet stationarity requirements, researchers must assess the temporal extent of stability to establish a solid foundation for further analysis. This step is essential because data stability is a prerequisite for determining the optimal lag, which serves as the boundary interval for subsequent calculations. The stability of the data is typically evaluated using the AR Roots table, where a modulus not exceeding one indicates satisfactory stability. Once stability is established, the optimal lag can be determined by selecting the lag with the highest criteria. However, in some cases, researchers may need to consider additional factors, such as causality tests and residual analysis, to refine their selection. According to Perangin-Angin et al. (2024), Akaike Information Criteria (AIC) is often employed in this process, as demonstrated in the given example, where the optimal lag for the research model was determined to be the ARDL lag (4, 12, 12, 11, 8). This optimal lag is then applied to the ARDL estimation process, ensuring that the model accurately captures the temporal dynamics of the data and provides a robust foundation for further analysis and interpretation of the results.

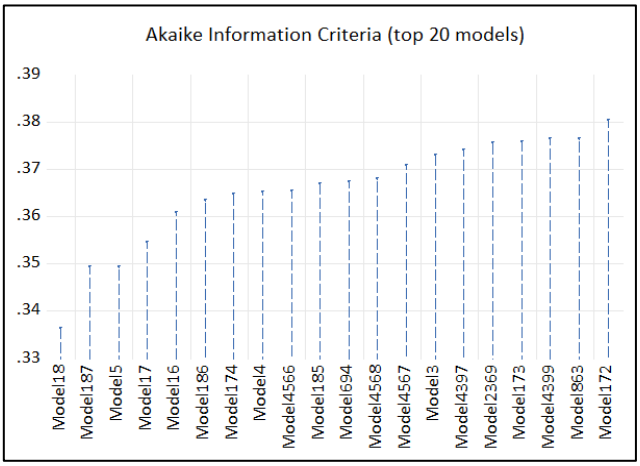


Figure 1. Result of Lag Optimum

3.4. Cointegration Test

Cointegration is an econometric concept that reflects the presence of a long-run equilibrium among financial time series. The Bound Test was employed to determine whether cointegration or a long-term relationship exists among the variables included in this study. The F-test forms the basis of this bound-testing methodology. Cointegration is absent if the F-statistic value is lower than the lower bound of cointegration. Conversely, cointegration occurs when the F-statistic value exceeds the upper bound (Christianti, 2020). In the ARDL model, it is crucial to assess the existence of a long-term relationship by conducting cointegration testing. This study utilized the ARDL bound test model to perform a cointegration test. The results of the stationarity tests are presented in Table 3.

Table 3. Result of the Cointegration Test

Model	F-Statistic	I(0)	I(1)	Decision
Bound testing	4.770847	2.56	3.49	Cointegrated

As shown in Table 3, the cointegration test results of the F-statistic value of this research model show a value of 4.770847, greater than the lower bound of 2.56 and the upper bound of 3.49 at the 5 percent confidence level. Therefore, the conclusion of the bound test results of the model in this study is cointegrated or has a long-term relationship with inflation and the other independent variables contained in the model.

3.5. ARDL Estimation

The ARDL estimation results elucidate the short-term relationship between the variables under investigation. The ARDL model was employed to analyze the data in this study. The CointEq coefficient estimation yielded a value of -0.2620, indicating a tendency towards equilibrium. Working capital credit in the short term demonstrates a positive effect, with a coefficient of 0.0035 at a 1 percent confidence level and a probability of 0.0095 for inflation in Indonesia. Investment loans in the short term exhibit no significant effect on inflation in Indonesia. Consumptive credit in the short term shows a positive effect, with a coefficient of 0.0153 at a 5 percent confidence level and a probability of 0.0215. The short-term BI rate has no significant influence on inflation in Indonesia. The results of the short-term ARDL estimation analysis are presented in Table 4:

Table 4. Result of ARDL Estimation in Short Term.

Variable	Coef.	Std. Error	t-Statistic	Prob.	Variable	Coef.	Std. Error	t-Statistic	Prob.
Δ(INF(-1))	-0.2956	0.0937	-3.1534	0.0029***	Δ(IC(-8))	0.0023	0.0022	1.0455	0.3015
Δ(INF(-2))	-0.3580	0.0839	-4.2645	0.0001***	Δ(IC(-9))	0.0020	0.0021	0.9325	0.3561
Δ(INF(-3))	-0.2881	0.0885	-3.2544	0.0022***	Δ(IC(-10))	0.0029	0.0022	1.3238	0.1924
Δ(WCC)	0.0035	0.0013	2.7126	0.0095***	Δ(IC(-11))	-0.0035	0.0021	-1.6326	0.1097
Δ(WCC(-1))	-0.0064	0.0024	-2.6929	0.0100***	Δ(CC)	0.0153	0.0064	2.3845	0.0215**
Δ(WCC(-2))	-0.0034	0.0023	-1.4636	0.1504	Δ(CC(-1))	0.0306	0.0087	3.4897	0.0011***
Δ(WCC(-3))	-0.0053	0.0019	-2.7180	0.0094***	Δ(CC(-2))	0.0130	0.0085	1.5296	0.1333
Δ(WCC(-4))	-0.0052	0.0019	-2.6551	0.0110**	Δ(CC(-3))	0.0148	0.0070	2.1076	0.0408**
Δ(WCC(-5))	-0.0051	0.0019	-2.6816	0.0103**	Δ(CC(-4))	0.0047	0.0063	0.7446	0.4604
Δ(WCC(-6))	-0.0047	0.0020	-2.3163	0.0253**	Δ(CC(-5))	-0.0051	0.0060	-0.8570	0.3960
Δ(WCC(-7))	-0.0030	0.0018	-1.6723	0.1016	Δ(CC(-6))	-0.0137	0.0063	-2.1460	0.0374**
Δ(WCC(-8))	-0.0009	0.0016	-0.5993	0.5520	Δ(CC(-7))	-0.0109	0.0062	-1.7577	0.0857*
Δ(WCC(-9))	-0.0007	0.0016	-0.4358	0.6651	Δ(CC(-8))	-0.0176	0.0066	-2.6416	0.0114**
Δ(WCC(-10))	0.0018	0.0016	1.1480	0.2571	Δ(CC(-9))	-0.0111	0.0068	-1.6242	0.1115

Δ(WCC(-11))	0.0034	0.0011	2.9206	0.0055***	Δ(CC(-10))	-0.0142	0.0066	-2.1409	0.0379**
Δ(IC)	0.0038	0.0027	1.4319	0.1592	Δ(BR)	-0.0357	0.1731	-0.2065	0.8373
Δ(IC(-1))	0.0042	0.0029	1.4225	0.1619	Δ(BR(-1))	0.3278	0.1931	1.6971	0.0967*
Δ(IC(-2))	0.0065	0.0029	2.1937	0.0336**	Δ(BR(-2))	0.3531	0.1890	1.8681	0.0684*
Δ(IC(-3))	0.0147	0.0029	5.0910	0.0000***	Δ(BR(-3))	0.1149	0.2005	0.5732	0.5694
Δ(IC(-4))	0.0151	0.0030	4.9835	0.0000***	Δ(BR(-4))	0.6613	0.1951	3.3879	0.0015***
Δ(IC(-5))	0.0117	0.0028	4.1302	0.0002***	Δ(BR(-5))	0.2645	0.2131	1.2411	0.2211
Δ(IC(-6))	0.0082	0.0028	2.9398	0.0052***	Δ(BR(-6))	0.3333	0.2052	1.6241	0.1115
Δ(IC(-7))	0.0045	0.0024	1.8830	0.0663*	Δ(BR(-7))	0.5237	0.2024	2.5864	0.0131**
CointEq(-1)*	-0.2620	0.0464	-5.6460	0.0000***					

3.6. Long-Term Estimation Results

Following the cointegration test in this study, the subsequent step involved testing the ARDL model. The ARDL model was employed to analyze the information derived from the existing data in this study. The autoregressive distributed lag estimation results yield a model that describes the long-term relationship between the variables. In the long run, working capital credit positively affects inflation in Indonesia, with a coefficient of 0.0391 at the 1 percent confidence level and a probability of 0.0069. Similarly, investment credit demonstrates a positive long-term effect of 0.0108 at the 5% confidence level, with a probability of 0.0374 for inflation. Conversely, long-term consumptive credit exerts a negative effect of -0.0820 at the 1% confidence level, with a probability value of 0.0003. The long-term BI rate indicates a negative effect with a coefficient of -2.1181 at the 1 percent confidence level, with a probability of 0.0032 for inflation in Indonesia. The results of the long-term estimation of the model are presented in Table 5.

Table 5. Result of ARDL Estimation in Long Term.

Variable	Coef.	Std. Error	t-Statistic	Prob.
WCC	0.0391	0.0138	2.8336	0.0069***
IC	0.0108	0.0050	2.1461	0.0374**
CC	-0.0820	0.0211	-3.8819	0.0003***
BR	-2.1181	0.6797	-3.1162	0.0032***

3.7. Classical Assumption Test

The classical presumption test points aim to decide the estimation model used to fulfill multiple linear assumptions and see if there is a relationship between variables. The heteroscedasticity test aims to see if there is an imbalance in changes from the residuals of one variable to another. The strategy used for the classic presumption test comprises Meidijati (2020). The classical assumption test is carried out by testing normality, autocorrelation, heteroscedasticity, and multicollinearity. The data normality test uses the Jarque-Bera Test, and autocorrelation is detected using the Breusch Godfrey LM Test. Heteroscedasticity problems will be tested using the Breusch-Pagan-Godfrey Test method. The results of classical assumption testing will be displayed in Table 6.

Table 6. Result of Classical Assumption Test

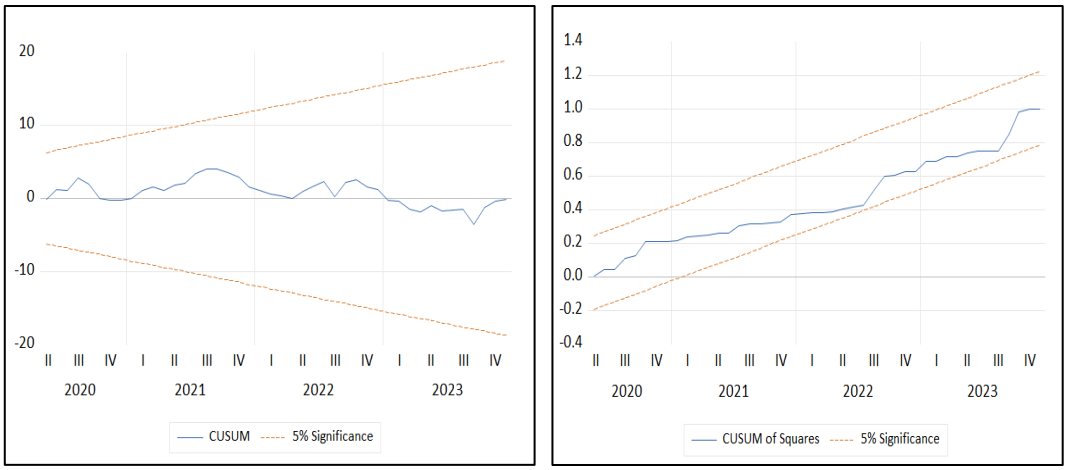
Variable(s)	WCC	IC	CC	BR
WCC	1.000	0.373	0.563	0.089
IC	0.373	1.000	0.382	0.173
CC	0.563	0.382	1.000	0.229
BR	0.089	0.173	0.229	1.000
Normality Test	Jarque-Bera		29,350	

	Prob.	0,2305
Autocorrelation Test	Obs*R-Squared	15,274
	Prob.	0,4659
Heteroscedasticity Test	Obs*R-Squared	481,566
	Prob.	0,5873

Table 6 presents the results of the normality test. This demonstrates that the residuals of this research model are normally distributed, as evidenced by the Jarque-Bera probability value of 2.9350, which exceeds 0.05. The probability of this research model was 0.2305, which was greater than 0.05. On the basis of the results of this study, an autocorrelation test using the LM Test indicated that no autocorrelation problems were detected. The results of this research model are demonstrated by the chi-square probability value of the Breusch–Pagan LM test, which is 0.4659, exceeding 0.05. No heteroscedasticity was observed in the model used in this study. This conclusion is derived from the chi-square probability value of the Breusch–Pagan Godfrey test, which is greater than 0.05. This research model has a probability of 0.5873, which is greater than 0.05, indicating that it exhibits homoscedasticity. The results of this study on multicollinearity testing indicated no significant correlation between the independent variables.

3.8. Model Stability

Two tests were conducted to evaluate the stability of the model and parameters: the CUSUM and CUSUMSq tests. If the CUSUM and CUSUMSq test plots fall outside the upper or lower limit, it can be concluded that the model and parameters lack stability (Abu & Staniewski, 2022). CUSUM and CUSUMSq tests were conducted for both research models to determine the stability of the research model. The results of the stability tests for this research model are shown in Figure 2. Figure (a) illustrates the CUSUM test, and (b) illustrates CUSUMSq. The results of the model stability test indicated that the proposed model demonstrated satisfactory stability.



(a) Figure CUSUM Test (b) Figure CUSUMSq Test

Figure 2. Result of Model Stability

The CUSUM test findings, depicted in Figure 2 (a), demonstrate that the CUSUM line falls within the critical values at a 5 percent significance level. This outcome validates the stability of the employed model throughout the research period. Similarly, in Figure 2 (b), the CUSUMSQ graph illustrates the CUSUM line positioned between the upper and lower boundaries at the 5 percent confidence threshold. This observation further confirms the stability of the research model in the CUSUMSQ analysis.

4. Discussion

In both the short and long term, working capital loans positively and significantly influence inflation in Indonesia. This study demonstrates that, in the short term, each increase of Rp1 billion in working capital credit results in a 0.0035 percent increase in inflation. These findings align with the research conducted by

Ivanovic (2016), who presents evidence of changes in credit supply before and after the global financial crisis. The post-crisis period exhibits increased indicators of supply and demand for working capital credit, which significantly impacts inflation. Research conducted by Leon (2020) further corroborates that the growth of working capital credit has a positive and substantial impact on the inflation rate, expanding financial ratios that indicate a company's profitability, particularly in total assets, by 0.323 percent. Additionally, Molyneux et al. (2020) demonstrate that money supply affects economic variables, with working capital loans positively affecting inflation.

The exchange rate influences bank lending, with fluctuations potentially leading to an increase in working capital lending. This finding aligns with research conducted by Galati et al. (2021) in the Netherlands, which revealed that financial institutions responded to restrictions by shifting towards long-term funding to safeguard credit operations. Consequently, it can be inferred that the limitations on working capital credit effectively achieve the primary objective of curbing inflation. However, Qomariyah & Imaningsih (2023) demonstrate that the impact of working capital loans on inflation is substantial, yet contingent upon various factors, including bank management's capacity to regulate operating costs and income, as well as regional structural changes. Over an extended period, a rise in working capital credit of Rp1 billion corresponds to a 0.0391 per cent increase in inflation.

Investment credit in the short term has no influence on inflation in Indonesia. Likewise, investment credit has a positive and significant influence on inflation in Indonesia in the long run. Diverse research emerges from studies on the relationship between investment credit and inflation. However, the results of this study contradict the hypothesis contained in this study. Researchers found several studies that were in line between investment credit and inflation had a positive effect, such as Afrizal et al. (2021), Hasan et al. (2022) and Octarina & Khoirudin (2022) investment credit has a positive and significant effect on inflation, which indicates that more available investment credit can lead to higher inflation. In the long run, if there is an increase in investment credit of Rp1 billion, inflation will increase by 0.0108 percent. Research by Anwar et al. (2023) also contradicts the hypothesis in this study through the Gross Domestic Product (GDP) in Indonesia, which is that investment credit has a good and positive impact on inflation. Research by Olonila et al. (2023) shows that monetary policy, including inflation, has a favourable impact on investment in Nigeria in the long run, which suggests that there may be an indirect relationship between investment credit and inflation. This research shows that although inflation can affect credit positively and significantly, it is likely to have a greater impact if various other variables influence it.

Consumptive credit in the short term positively and significantly influences inflation in Indonesia. In this study, in the short term, every increase in consumptive credit of Rp1 billion will cause inflation to increase by 0.0153 percent. This research is in line with the research of Gumata et al. (2017) found that the impact is greater when consumptive credit decreases and positively affects inflation, which various external factors can influence. Diao (2020) shows that inflation has a positive effect; however, the impact is not direct. Any household wants to spend more on goods, especially to buy goods that are not needed, when the household has no credit limit. Then, Halim et al. (2022) found that consumptive lending and inflation are simultaneously influenced by people acquiring control, financial development, per capita income and other variables. This research is also in line with the research of Kanagatova, D., & Kenzhegaliyeva (2023) which shows that consumptive credit has an important influence on the carrying capacity of banks, with the mental component playing a more important role than the financial component, which can affect total aggregate demand and economic growth.

This research in the long run should have a positive effect, but the results show that it contradicts the hypothesis in this study. This research is in line with research conducted by Mallick & Mohsin (2016), which shows that consumptive credit can contribute to reducing inflation but has a negative effect. Consumptive credit in the short term and long term both negatively and significantly affect inflation caused by the nominal exchange rate, financial innovation, interest rates, and economic growth (Katusiime, 2018). Acharya et al. (2020) support this research by showing that consumptive credit given to a company that cannot survive will cause an excess supply of aggregates and a situation where the price level increases at a slower growth rate or is commonly called disinflation. Then, this research is the same as research by Kim et al. (2021), which found that consumptive credit has a negative impact on inflation caused by consumption costs and output, which in turn also highlights the vulnerability of the economy and financial markets. In Ugurlu (2021) research shows that consumptive credit has a negative influence that can cause inflationary pressures, which in turn can trigger structural changes in the economy.

The BI rate does not influence inflation in Indonesia in the short term. However, from the results of this study, in the long run BI rate has a negative and significant effect on inflation in Indonesia. Indicating that if the BI rate decreases by 1 percent, it will be able to reduce inflation by 2.1181 percent. Several studies

align with this research, such as, according to Deviana (2014), detailing the negative impact of interest rates on inflation and saying the relationship between interest rates and inflation may be volatile. The research conducted by Zunaitin et al. (2017) shows that the BI rate has a negative effect on inflation because Bank Indonesia can reduce the inflation rate and ensure it is in line with the inflation target by using the BI rate. In the research of Hesniati et al. (2022) stated that the BI rate also has a negative relationship to inflation in Indonesia, which is caused influenced by other variables such as exchange rate and money supply (M2). In Murtiningrum (2023), her study shows that the BI rate negatively affects inflation. Therefore, the BI rate can affect the capital market, which is influenced by changes in the BI rate, which will affect the exchange rate of the rupiah against the dollar. If there are fluctuations in inflation, it is a warning sign for issuers in the consumption sector. However, Sari et al. (2024) showed that the results of research on the impact of BI rate negatively affect inflation. Overall, the results of this work suggest that different approaches to credit and money-related measures have different impacts on expansion in Indonesia. Changes in the BI rate have a slower impact compared to credit, which often has a coordinative impact on inflation.

Bank Indonesia has a policy that is useful for making decisions by controlling the money supply and circulation. The arrangement conducted by Bank Indonesia is called the related approach. A financial approach could be an arrangement to attain and keep up rupiah solidness through the money supply and intrigued rates set by Bank Indonesia. Monetary policy consists of money supply, primary money and bank credit. Monetary policy efforts to maintain macroeconomic stability can be recognized through low inflation rates. There are two types of policies: contractionary financial approach and expansionary financial arrangement. A contractionary financial arrangement may be a way to decrease the cash supply, which will impact increasing interest rates. Expansionary monetary policy is a policy to increase the money supply, which lowers interest rates. This research has proven that when credit increases, Bank Indonesia will conduct a contractionary policy by reducing the money supply so that interest rates will increase. When credit decreases, Bank Indonesia will conduct an expansionary policy by adding to the money supply so that it will reduce interest rates.

5. Conclusions

This study concludes that in the short term, working capital and consumptive loans positively affect inflation in Indonesia. Investment credit and the BI rate in the short term do not influence inflation in Indonesia. In the long run, working capital and investment loans positively affect inflation in Indonesia. Conversely, consumptive credit and BI rates negatively affect inflation in Indonesia in the long run. Bank Indonesia is implementing measures to strengthen coordination in controlling inflation, as well as in maintaining monetary stability and enhancing the financial system, particularly at the interest rate level, in collaboration with the government. Financial institutions, such as banks functioning as intermediary institutions, can analyze the utilization of working capital credit, investment credit, and consumptive credit to ensure they are appropriately targeted, thereby enabling bank credit to contribute to controlling the inflation rate in Indonesia.

Author Contributions: Conceptualization, C.N.F. and V.S.; methodology, C.N.F.; software, C.N.F.; validation, R.M., M.A., and M.N.; formal analysis, C.N.F. and V.S.; investigation, C.N.F. and V.S.; resources, C.N.F.; data curation, V.S. and C.S.; writing—original draft preparation, C.N.F. and V.S.; writing—review and editing, C.N.F., V.S. and C.S.; visualization, C.N.F.; supervision, V.S. and C.S.; project administration, C.N.F.; funding acquisition, C.N.F. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: The authors would like to thank Universitas Syiah Kuala, Aceh, Indonesia, for supporting this research and publication. We would also like to thank the reviewers for their constructive comments and suggestions.

Conflicts of Interest: The authors declare no conflict of interest.

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