THE EFFECT OF BANK CREDIT TOWARDS ECONOMIC GROWTH IN INDONESIA

BACHELOR THESIS

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MOTTOS AND DEDICATIONS

"So, surely with hardship comes ease"

Q.S. Asy Syarh (95): 4

For my parents, my sister, and my family

ABSTRACT

This research aims to find the effect of bank credit on economic growth in Indonesia from 2015 to 2022. The independent variables used in this research are Investment Credit, Working Capital Credit, Government Capital Expenditure, and Total Labor. Using the Error Correction Model, the results of this research show that investment and working capital credit had a positive and significant effect on economic growth. In contrast, government capital expenditure and total labor negatively and insignificantly affected economic growth.

Keywords: economic growth, bank credit, Error Correction Model (ECM)

ABSTRAK

Penelitian ini bertujuan untuk mengetahui adanya hubungan antara pertumbuhan ekonomi dan kredit bank di Indonesia pada tahun 2015 sampai 2022. Variabel bebas yang digunakan pada penelitian ini adalah Kredit Investasi, Kredit Modal Kerja, Belanja Modal Pemerintah, dan Total Tenaga Kerja. Dengan menggunakan Error Correction Model *(ECM), hasil dari penelitian ini menunjukkan bahwa Kredit Investasi dan Kredit Modal Kerja memiliki pengaruh positif dan signifikan terhadap pertumbuhan ekonomi. Sebaliknya, Belanja Modal Pemerintah dan Total Tenaga Kerja memiliki pegaruh negatif dan tidak signifikan terhadap pertumbuhan ekonomi.*

Kata kunci: pertumbuhan ekonomi, kredit bank, Error Correction Model *(ECM)*

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INTRODUCTION

1.1 Background of The Research

Economic growth can be described as improving economic conditions from one era to the next. It can also be used to determine the level of wealth enjoyed by a country's population. A high economic growth rate suggests that a nation's citizens have a higher degree of wealth than others. One way to increase economic growth is through financial sectors, notably the financial market.

The financial market is a marketplace for trading financial instruments such as stocks, bonds, and foreign currencies. The financial sector is an integral part of a country's economy because it attracts investments that can help increase economic growth. In the financial market, financial intermediaries served as a link between parties with surpluses and those with deficits. As a result, a well-functioning credit intermediation process removes external funding constraints that hinder credit market expansion and business expansion (Mishkin, 2007). Banks, insurance companies, financial counselors, and others are examples of financial intermediaries.

Banks and non-bank financial institutions are the two types of financial intermediaries. Banks are financial institutions that take public deposits and provide public lending services. Banks are divided into various categories: traditional, sharia, merchant, etc. Insurance companies, pension funds, and other non-bank financial institutions are examples of non-bank financial institutions that provide financial services to the public but are not banks.

According to Dişbudak (2010), the causation between economic growth and credit market development can run in various directions, depending on the macroeconomic outlook. On the one hand, a highly developed credit market increases resource allocation efficiency, whereas economic growth supports financial development through expanding credit markets (Mishra, Das, and

Pradhan, 2009). Bezemer (2014), on the other hand, found that the link between credit/GDP ratio and economic growth had a negative effect.

The Indonesian credit market has experienced significant changes throughout the decade, particularly after the 1997 Asian Financial Crisis. Prior to the 1997 crisis, the Indonesian credit market grew significantly in the late 1980s and early 1990s. Financial deregulations imposed by the New Order Government in the late 1980s, aimed at broadening credit expansion, were to blame. This was done to boost economic growth, which had been stagnant in recent years. However, when the Asian Financial Crisis occurred in the late 1990s, this policy would pose problems.

The Indonesian banking system was already weak when the Asian Financial Crisis erupted in 1997 due to financial deregulations implemented during the previous decade. The failure of the interbank money market generated a liquidity problem due to this policy (Raz, 2013). Bank Indonesia attempted to solve the situation by raising interest rates, but instead of improving liquidity, it exacerbated the crisis and generated widespread fear. Then, Bank Indonesia launched Bank Indonesia Liquidity Assistance (BLBI) to prevent the financial sector from becoming even more chaotic. To assist unsound banks, BLBI prepared a Rp 144.5 trillion bailout. In addition, Bank Indonesia established the Indonesian Banking Restructuring Agency (IBRA, also known as the Badan Penyehatan Perbankan Nasional, or BPPN) and gave it the responsibility of overseeing, managing, and restructuring troubled banks in addition to dispersing the government's blanket guarantee program. IBRA was terminated in 2004 after fulfilling its duties.

Credits that banks give can be categorized into many forms, one of which is the types of usage. Consumption, investment, and working capital are the three categories of uses. Credit for working capital is credit used to support a business's ongoing operations. Consumption credit is credit used for buying goods and services, whereas investment credit is credit used for making investments like purchasing new machinery or constructing new factories. In much recent

development, Table 1.1 below depicts the total bank credit based on the types of usage from 2010-2019.

Table 1.1 Total Credit Based on Types of Uses, 2010-2019

Year	Total Working Capital	Total Investment	Total Consumption	Total Credit
2010	1.793.378,03	710.665,58	1.097.886,81	3.601.930,42
2011	2.180.520,10	946.702,72	1.378.292,09	4.505.514,91
2012	2.691.310,95	1.209.900,06	1.665.570,49	5.566.781,5
2013	3.245.090	1.630.764,99	1.898.447,49	6.774.302,48
2014	3.595.181	1.848.999,43	2.108.772,47	7.552.952,9
2015	3.915.021,35	2.124.577,59	2.294.974,22	8.334.573,16
2016	4.188.296,16	2.312.101,59	2.508.661,79	9.009.059,54
2017	4.548.427,07	2.372.966,01	2.793.384,86	9.714.777,94
2018	5.133.435,7	2.694.540,16	3.091.063,59	10.919.039,45
2019	5.267.981,46	3.050.933,26	3.280.195,59	11.599.110,31

Source: Statistik Perbankan Indonesia and Statistik Perbankan Syariah

The growth of credit in each type of usage had a growing trend, with each year bigger than the last. The largest share went to working capital, followed by consumption and investment. This suggested that rather than consuming goods and services or investing in business equipment, Indonesians mostly used credit from financial institutions to fund the ongoing operations of their enterprises. Over ten years, the aggregate growth of all three classes amounted to Rp 7.997.179,89 billion.

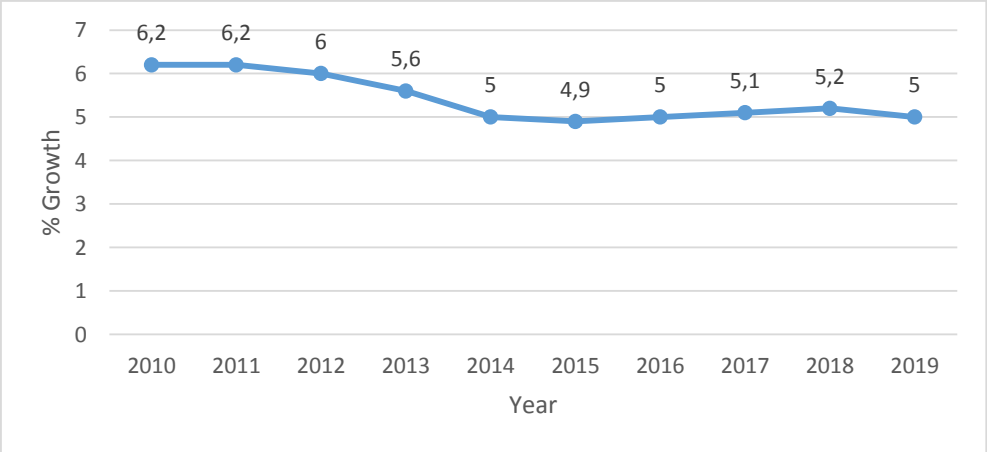
The tendency for Indonesians to use credit given by banks to fund their businesses suggests that their credit is considered productive, per Bezemer's (2014) explanation. Bezemer explained that there are two sorts of credit: productive and non-productive. Income-generating loans are referred to as productive credit, while consumptive credit is referred to as non-productive credit. According to Bezemer's research, productive credit is more likely to boost economic growth, but non-productive credit is more likely to stifle it.

Productive credit, such as working capital and investment credit, boosts the economy by expanding production or creating new businesses. Giving money to

existing or prospecting businesses gives them the capital to grow their business further. This means money is spent on new machines or hiring people into the workforce. Business expansion happens, which increases production while new workers use their salaries to consume goods and services, moving the wheels of the economy.

One indicator of economic growth is the growth of Gross Domestic Product (GDP). The graphics for Indonesia's annual GDP growth from 2010 to 2019 are depicted below.

Figure 1.1 Annual GDP Growth (%), 2010-2019



Source: World Bank

Indonesia's annual GDP growth has been slightly declining in the last decade. The highest was 6,2 percent in 2010-2011, and the lowest, which coincided with a national disaster of forest fire and haze, was 4,9 percent in 2015, which cost Rp 221 trillion in damage (World Bank, 2015). Despite this declining trend, GDP growth remains stable, especially after 2014, with more or less 5 percent growth per year.

However, if we compare the ratio of domestic credit to the private sector in several ASEAN countries, Indonesia has the lowest rate, as seen in Table 1.2.

Table 2.2 Domestic Credit To Private Sector By Banks Ratio In Several ASEAN Nations (% of GDP), 2018-2022

Year	Indonesia	Malaysia	Singapore	Vietnam	Thailand
2018	38,8	120,3	117,8	105,3	112.1
2019	38,4	120,7	119,3	108	111,3

2020	38,7	133,8	129,5	115,3	125,4
2021	37	127,2	-	124,4	126,9
2022	35,3	113,3	-	126,4	121

Source: World Bank

The data displayed in Table 1.2 show that Indonesia's domestic credit ratio is considerably smaller than that of other countries such as Malaysia and Vietnam. This means that the private sector in Indonesia did not take as many loans as in these countries, even during 2020 and 2021, when the COVID-19 pandemic was on the rise.

1.2 Problem Formulation

Although Schumpeter proposed the original idea in the 20th century, studies regarding the relationship between credit and economic growth are still worth studying. Findings differ from studies; Ho (2002) and Dişbudak (2010) showed a positive relationship between bank credit development and economic growth, while Loayza and Ranciere (2006) suggested a negative relationship between bank credit development and economic growth in the short run. Therefore, the problems that this research would like to answer are:

1. Does the relationship between bank credit and economic growth in Indonesia is positive or negative?
2. Does the relationship between bank credit and economic growth in Indonesia significant or not?

1.3 Purpose of the Study

Based on the formulation of the problem, the purposes of this research are as follows:

1. To determine whether a relationship between bank credit and economic growth in Indonesia is positive or negative.
2. To find out whether the relationship between bank credit and economic growth in Indonesia is significant or insignificant.

1.4 Usefulness

The results of this study are expected to provide benefits such as:

1. Theoretical Benefit

This research can provide an empirical overview of the relationship between bank credit development and economic growth in Indonesia. The results are expected to provide policymakers with answers and a new viewpoint on bank credit's contribution to Indonesian economic growth.

2. Practical Use

This research provides information for future research and studies in the form of references and adds to the literature regarding the relationship between bank credit and economic growth in Indonesia.

1.5 Structure of Writing

To simplify the research discussion, the writing of this thesis is arranged systematically and will be presented in five chapters as follows:

Chapter I Introduction: This chapter describes the background of the effect of bank credit towards economic growth in Indonesia, the formulation of the problem regarding the effect of bank credit towards economic growth in Indonesia, the purposes and benefits of the effect of bank credit towards economic growth in Indonesia, and the research systematics for the effect of bank credit towards economic growth in Indonesia.

Chapter II Literature Review: This chapter covers the theoretical basis of bank credit and economic growth, a discussion of previous research regarding the effect of bank credit towards economic growth, a theoretical framework related to the effect of bank credit towards economic growth, and the hypotheses of the effect of bank credit towards economic growth in Indonesia.

Chapter III Research Method: This chapter explains how the research methods for the effect of bank credit towards economic growth in Indonesia will be implemented operationally.

Chapter IV Results and Discussions: This chapter describes the research object, data analysis, interpretation of results, and discussion of research results regarding the effect of bank credit towards economic growth in Indonesia.

Chapter V Conclusion: The last chapter contains conclusions regarding the effect of bank credit towards economic growth in Indonesia and limitations in research related to bank credit and economic growth.

CHAPTER II

LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 The Concept of Economic Growth

Despite having multiple definitions, economic growth is usually defined as an increase in overall production in an economy. A country with an increase in national income or per capita income means that the country is experiencing positive economic growth and vice versa.

The most common way to measure economic growth is through Gross Domestic Product (GDP), which uses consumption, investment, government spending, and net export. GDP is the final value of goods and services produced in an economy for a set amount of time, usually in one year. In macroeconomic understanding, economic growth is the increase in GDP. GDP can be measured in three approaches: production, income, and expenditure. Production and income approaches were aggregate supply and expenditure approaches from the aggregate demand side. In the production approach, GDP is the value of all goods produced in all economic sectors. The Badan Pusat Statistik (BPS) categorizes 16 economic sectors to measure the national economy, which are:

1. Agriculture, Forestry, and Fisheries
2. Mining and Quarrying
3. Manufacturing
4. Electricity, Gas, Steam, and Air Conditioning Supply
5. Water Supply, Sewerage, Waste Management and Remediation Activities
6. Construction
7. Wholesale and Retail Trade, Repair of Vehicles and Motorcycles

8. Transportation and Storage
9. Accommodation and Communication
10. Financial and Insurance Activities
11. Real Estate Activities
12. Business Activities
13. Public Administration and Defense, Compulsory Social Security
14. Education
15. Human Health and Social Work Activities
16. Other goods and services

In the income approach, GDP is measured from the incomes received by production factors in every economic sector, such as workers (salary and wages), landowners (rent/selling land), investors (investments/interest rate), and business owners (profit/companies). In this approach, the calculation of GDP includes depreciation, and all incomes are calculated before taxes.

According to the expenditure approach, GDP is the total of final demand or aggregate demand, which includes household and private non-profit-oriented consumption (C), the formation of gross domestic capital accumulation (I), government consumption expenditure (G), and total net export (X-M).

To figure out the economic condition of a country, GDP can be calculated based on current market prices (nominal GDP) and constant prices (real GDP). Nominal GDP is the added value of goods and services based on current market prices, whereas real GDP is the added value of goods and services based on a specific year as a basis of calculation. Economic growth can be seen from real GDP growth, whereas nominal GDP is used to figure out changes and economic structures. Economic growth can be calculated with the following equation:

$$\mathbf{EG} = \frac{(\mathbf{GDP_t} - \mathbf{GDP_{t-1}})}{\mathbf{GDP_{t-1}}} \times \mathbf{100\%} \qquad \text{.....} \quad \mathbf{(2.1)}$$

Where EG is economic growth, GDP_t is gross domestic product year t, and GDP_{t-1} is gross domestic product year t-1.

Investment can affect economic growth through aggregate demand. Aggregate demand is the sum of the demands for current output by each buying sector of the economy: households, businesses, the government, and foreign purchasers of exports (Froyen, 2013). Aggregate demand in the Keynesian framework can be calculated with the following equation:

$$\boldsymbol{AD = C + I + G + (X - M)} \quad \text{..... (2.2)}$$

Where C represents consumption, I represents investment, G denotes government spending, and (X-M) represents net export.

Keynes suggested two primary investment expenditure determinants: interest rate and business expectation. Keynes describes the relationship between interest rate and investment as inverse. This means that when the interest rate is high, the level of investment will be low, and vice versa.

2.1.2. The Solow Economic Growth Theory

The Solow neoclassical growth model differs from the Harrod-Domar model by adding a second factor (workforce) and a third independent variable (technology) to the economic growth equation. According to the Solow neoclassical model, technological advancements support economic growth, and short-term equilibrium is the outcome of different ratios of labor and capital in the production function. According to the model, income levels will converge to the same level if economies experience the same rates of savings, depreciation, labor force growth, and productivity growth.

According to traditional neoclassical growth theory, an increase in output can be attributed to one of three things: an increase in capital (through investments and savings), labor quantity and quality (through population growth and education), or technological advancement. In the short run, closed economies with lower savings rates grow more slowly than open economies with higher savings rates and, conversely, tend to converge to lower income per capita levels.

However, as capital flows from wealthier to poorer nations, where capital-labor ratios are lower, and returns on investments are higher, open economies experience income convergence at a higher level. According to the neoclassical growth theory, the stricter governments of developing countries will stifle economic growth by stopping the inflow of foreign investments.

Formula-wise, Solow's neoclassical growth theory can be explained with the following aggregate production function:

$$\boldsymbol{Y = K^{\alpha}(AL)^{1-\alpha}} \quad \text{(2.3)}$$

Where Y is GDP, K is capital supply (including human and physical capital), L is labor, and A is labor productivity, the growth of which is exogenous over time. α is output elasticity in relation to capital. With the assumption that α is less than 1, this theory postulates that there is a decreasing value in capital and labor under the assumption and that private capital will be paid according to its marginal product in the absence of an external economy.

The main difference between the Solow model and the Harrod-Domar model is that the Solow model permits labor and capital to be substituted. A diminishing return is assumed to exist throughout the process. It is assumed that the aggregate function Y=F(K, L) has properties in a constant results scale. In the case of the Cobb-Douglass production function, the function has, at any given time (*t*),

$$\boldsymbol{Y(t) = K(t)^{\alpha}(A(t)L(t))^{1-\alpha}} \quad \text{(2.4)}$$

Because of constant return to scale, the output will also increase uniformly if the input is increased uniformly. The formula is,

$$\boldsymbol{\gamma Y = F(\gamma K, \gamma L)} \quad \text{(2.5)}$$

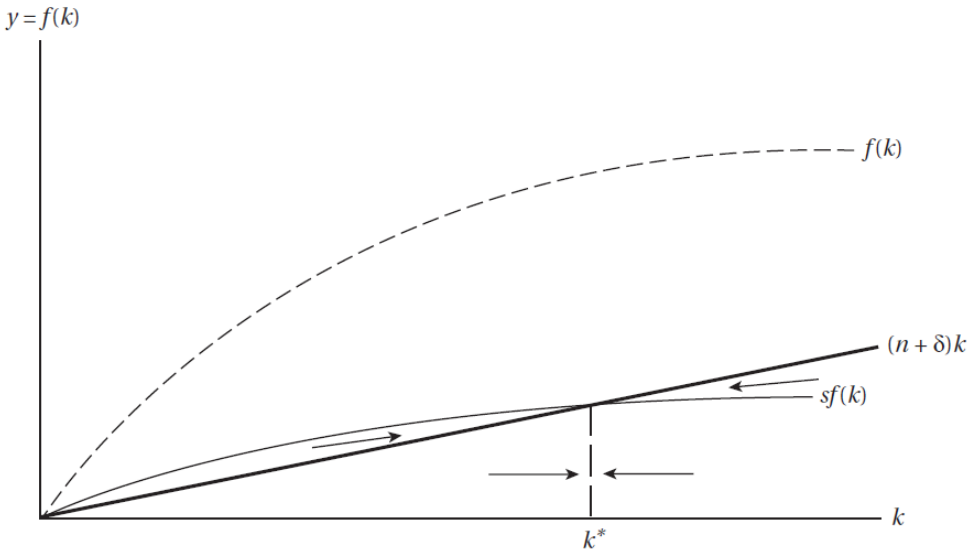
Where γ is a positive amount.

Because γ can be any positive real number, a mathematical way to analyze the implication of the model is by determining that γ=1/L, therefore

$$\boldsymbol{\frac{Y}{L} = f(\frac{K}{L}, 1)} \text{ or } \boldsymbol{y = f(k)} \quad \text{(2.6)}$$

The concave shape of *f(k)* mirrored the diminishing return of capital per worker, as shown in Figure 2.1. In the Harrod-Domar model, the line would be straight and upward-sloping.

Figure 2.1 Solow Equilibrium Curve



Source: Todaro and Smith (2011)

Only one of the production function's arguments is resolved by the simplification. For example, in the Cobb-Douglas case introduced in equation 2.3,

$$\boldsymbol{y = Ak^{a}} \quad \text{..... (2.7)}$$

Represents an alternative way of thinking about how the production function works, where everything is measured in terms of output per worker. According to equation 2.4, the amount of capital per worker is a function that affects output per worker. Each worker can produce more output the more capital they are required to use. For instance, the labor force grows at rate *n* per year, and labor productivity growth (the rate at which *A* in the production function increases) occurs at rate λ. When savings outpace depreciation by the amount

required to provide new workers with the same level of capital as current workers, the total capital stock increases.

The Solow equation (2.5) provides the growth of the capital-labor ratio, *k* (capital deepening). It shows that the growth of *k* depends on savings *sf(k)*, after allowing for the amount of capital needed to service depreciation, *δk*, and after capital widening that provides the existing amount of capital per worker to net new workers joining the labor force, *nk*. That is,

$$\Delta \boldsymbol{k} = \boldsymbol{sf}(\boldsymbol{k}) - (\boldsymbol{\delta} + \boldsymbol{n})\boldsymbol{k} \quad (2.8)$$

Versions of the Solow equation are also valid for other growth models, such as the Harrod-Domar model.

For simplicity, we are assuming for now that *A* remains constant. The steady state, also known as the situation in which output and capital per worker are no longer changing, will exist in this case. To find this steady state, set *Δk=0*:

$$\boldsymbol{sf}(\boldsymbol{k}^*) = (\boldsymbol{\delta} + \boldsymbol{n})\boldsymbol{k}^* \quad (2.9)$$

The *k** represents the capital per worker ratio at a steady state for the economy. Equation 2.2 provides evidence that this equilibrium is stable. The steady state is defined by the capital per worker *k**. *k** is a stable equilibrium because the economy will return to the steady state condition if *k* is higher or lower than *k**.

Regarding how investment influences production function, investment plays a role as a productivity booster through procuring production goods or tools and labor education, also called human capital, so that production activity will be more effective and efficient. Translated into the Solow neoclassical theory stated in equation (2.3), investment affected K and L.

2.1.3 The Concept of Credit

Credit comes from the Latin word *credit*, meaning "one believes." It means that the lender trusted the debtor to return the debt along with the interest rate according to the agreement. According to the 1998 Article No. 10, credit is a

provision of money or its equivalent based on an agreement between a bank and another party that requires the debtor to pay their debt with interest after a certain time.

Credit functions as a tool for wealth distribution. Banks and other financial intermediaries collect money from investors and the general public as deposits and distribute it as credit to those who need it. This means there is a wealth transfer from people with surplus money to people who need money. In the same way, credit is also a tool for capital distribution, as credit channels money from investors to businesses that need it.

Credit also helps to boost economic growth. The transfer of capital in the form of money mentioned before means that more money exists to improve other forms of capital, such as machinery or labor education. This, in turn, increases production, which boosts economic growth.

The Indonesian monetary system generally separates credit based on the usage: working capital, investment, and consumption.

1. Working capital credit: a credit that serves as additional capital to its debtor. Working capital credit is usually short-term and adjusted to the debtor's capital circulation. This type of credit is further classified into two types, revolving and non-revolving.
2. Investment credit: a credit used for long-term capital investments for the debtor. Investment credit is usually used for purchasing or replacing capital in the debtor's business to increase production effectiveness and efficiency so that productivity increases. Investment credit is usually mid-term or long-term.
3. Consumption credit: a credit used for the consumption of goods and services of the debtor and not for capital goods. The debtor uses consumption credit for personal consumption of goods and services.

2.1.4. The Concept of Labor

Labor is an essential part of economic growth. According to 2003 Article No. 13, labor means someone who worked for payments, whether in money or goods. As stated in Case and Fair (2019), an economy has three market arenas: the goods and services market, the labor market, and the Money Market. In the labor market, households supply labor while firms and the government demand labor. Labor productivity can be improved through productive investments such as skill, value, and health resulting from expenditures on education, on-the-job training programs, and medical care (Todaro and Smith, 2011). It can be analogized as a stock of human capital (Solow, 1999).

Human capital is crucial to economic growth. The Human Development Index (HDI) determines the level of human capital. HDI measures a country's average achievements in life expectancy at birth, mean years of schooling, expected years of education, and Gross National Income (GNI) in PPP terms. BPS recorded in 2022 that Indonesia's HDI reached 72,91 points, a 0.62-point increase from 2021.

2.1.5. The Concept of Government Capital Expenditure

Government capital expenditure is defined as expenditures made by the government to acquire fixed or other assets that provide benefits for more than one accounting period. According to Attachment III Peraturan Menteri Keuangan Number 101/PMK.02/2011 about budget classification, capital expenditure is used for:

1. Land, such as acquiring land, making land certificates, treating land, and so on, until the land is ready to be used.
2. Equipment and Engine, such as purchasing equipment and engine, transportation cost, and installation fees until the equipment and engine can be used.
3. Buildings, such as purchasing existing buildings, construction fees of new buildings, notary fees, and so on, until the building is ready to be used.

4. Roads, Irrigation, and Network, such as construction fees and other costs until the roads, irrigation, and network are ready to be used.
5. Others, including leasehold, the purchase of art and museum pieces, livestock, and books and scientific journals.
6. Badan Layanan Umum (Common Service Agency), for assets used by Common Service Agency operations.

2.2 Previous Studies

Several studies linked bank credit to economic growth. Raz (2013) found bidirectional causalities between economic growth and credit market development and credit development and lending rate in Indonesia. He discovered that the causality running from the credit market to economic growth is achieved through improved banking supervision and lending rates in the presence of effective monetary instruments, which can be used to respond to the development in the credit market to prevent overheating the financial market.

Balago (2014) found that total bank credit to the production sector, total bank credit to the general commerce sector, and total bank credit to the services sector contribute positively to Nigeria's economic growth. The results suggested a long-run relationship between the variables, and despite being less preferred, bank credits used by the services sector contributed more to the economy than the other two.

Garcia-Escribano and Han (2015) examined the relationship between credit and economic growth in Emerging Markets (EM) and found that credit growth significantly impacted economic growth. They found that corporate credit shock tends to have a minor effect on GDP growth, whereas consumer credit shock has a more significant effect. Also, housing credit shocks positively impact economic growth through the consumption channel.

Ananzeh (2016) found that a long-run relationship between real GDP and its explanatory variable of total credit facilities for all sectors, bank credit facilities for the agriculture sector, bank credit facilities for the industry sector, bank credit

facilities for the construction sector, and bank credit facilities for tourism sector existed in Jordan from 1993 to 2014. The results report that bidirectional causality was observed between economic development and bank credit for construction.

Belinga et al. (2016) found that banking credit does cause economic growth in Cameroon in the long run. Puatwoe and Piabuo (2017) also confirm that the relationship between bank credit development and economic growth exists in Cameroon in the long run.

Table 2.1

Previous Researches

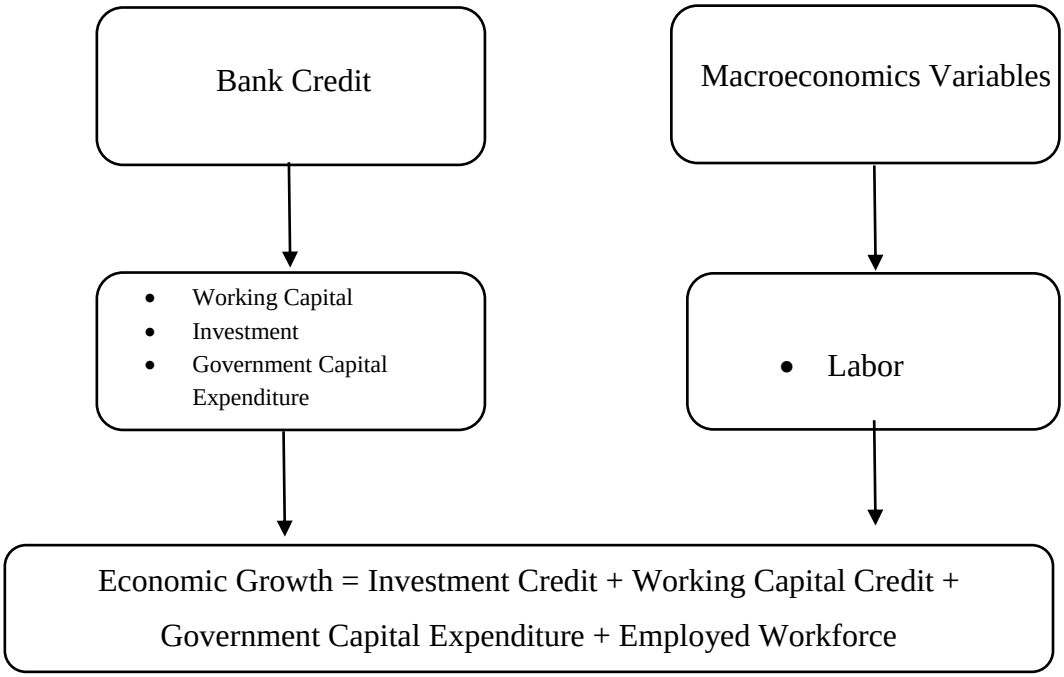
Authors	Methodology	Findings
Raz (2013)	Unit Root Test, Cointegration Test, and Granger Causality Test	A bidirectional relationship between economic growth and credit market development exists in Indonesia
Balago (2014)	Ordinary Least Square (OLS), and Vector Error Correction (VEC) Model	Total bank credit to the production sector, total bank credits to the general commerce sector, and total bank credits to the services sector have a positive effect on economic growth in Nigeria
Garcia-Escribano and Han (2015)	OLS, Two-stage Least Square (2SLS), and Arellano-Bond Dynamic Generalized Method of Moments (GMM)	Credit growth had a significant impact on economic growth in emerging economies.
Ananzeh (2016)	Unit Root Test, Vector Autoregressive (VAR) model, and Granger Causality Test	There is a positive relationship between bank credit and economic growth in Jordan.
Belinga et al. (2016)	Augmented Dickey-Fuller Test, Johansen Cointegration Test, and VECM	There is a positive relationship between banking credit and economic growth in Cameroon
Puatwoe and Piabuo (2017)	Autoregressive Distributive Lag (ARDL) model	There is a long-run relationship between bank credit development and economic growth in Cameroon.

2.3 Conceptual Framework

The conceptual framework thus laid by the theory stated earlier in this chapter is as follows:

Figure 2.2

Conceptual Framework



2.4 Research Hypothesis

A hypothesis is a temporary assumption between the dependent and independent variables. Therefore, according to the theories laid before, the hypothesis of this research is as follows:

1. Bank credit

   ***H0* = There existed a positive relationship between bank credit and economic growth in Indonesia**

   ***HI* = There is no positive relationship between bank credit and economic growth in Indonesia**

2. Government Capital Expenditure

   ***H0* = There existed a positive relationship between government capital expenditure and economic growth in Indonesia**

   ***HI* = There is no positive relationship between government capital expenditure and economic growth in Indonesia**

3. Total Labor

   ***H0* = There existed a positive relationship between total labor and economic growth in Indonesia**

   ***HI* = There is no positive relationship between total labor and economic growth in Indonesia**

CHAPTER III
RESEARCH METHOD

3.1 Research Variables

3.1.1 Dependent Variable

A dependent variable is a variable that is influenced by an independent variable. The dependent variable used in this research is Gross Domestic Product (GDP).

3.1.2 Independent Variable

An independent variable influences the dependent variable. In this research, the independent variables are investment credit, working capital credit, government capital expenditure, and total labor.

3.2 Operational Variable Definition

The operational definitions of the variables are as such:

1. Gross Domestic Product is the total sum of goods and services produced by an economy in one year. Gross Domestic Product value is in Billion Rupiah.
2. Investment credit is credit given by financial institutions for the purpose of acquiring fixed assets. The investment credit value is in Billion Rupiah.
3. Working capital credit is credit given by financial institutions to help businesses acquire capital goods. The working capital credit value is in Billion Rupiah.
4. Government capital expenditure is the expenditure of capital goods the government makes during a given period. The value of government capital expenditure is in Billion Rupiah.
5. Total labor is the number employed Indonesians in the workforce. The total labor value is in millions of people.

3.3 Data Types and Sources

This study is a quantitative research using secondary time series data. The data used in this study were obtained from multiple sources such as Bank Indonesia, World Bank, Badan Pusat Statistik (BPS), State Budget Portal, and Direktorat Jenderal Perbendaharaan (DPJB).

3.4 Data Collection Method

The data collection methods for this research are literature study and document study. A literature study collects relevant information from notes, literature, and documentation regarding the research. Document study gathers information from news, journals, reports, etc.

3.5 Data Analysis Method

The analysis method used in this research is the Error Correction Model (ECM) using the program Eviews 12. Error Correction Model is employed when there is an indication that the time series data might be non-stationary to see the influence between dependent and independent variables in the short run and long run.

The first step is to test data stationarity using the unit root test. If the data is not stationary, a cointegration test is employed.

The benefits of using ECM are:

1. ECM helps specify the model from a common form.
2. ECM can be performed on short-run or long-run data and can detect the consistency of the empirical model with economic theory.
3. ECM helps to solve nonstationary time series data.

The method used in this research came from Ananzeh (2016), who employed Real GDP as the dependent variable, bank credit for agriculture, industry, construction, and tourism sectors as the independent variable, and total bank credit for all sectors as the independent variable. This research modifies the independent variable into investment credit, working capital credit, government capital expenditure, and total working-age Indonesians who worked a job.

3.5.1 Long-run Model

The long-run OLS model for this research is:

$$Y_t = \beta_0 + \beta_1 x_t + \mu_t \quad \text{(3.1)}$$

Where Y_t is the dependent variable at t period, β_0 is constant, x_t is the independent variable at t period, β_1 is the parameter coefficient for the variable x, and μ_t is the residual at t period. However, because equation (3.1) is not linear, it needed to be log-transformed into:

$$\ln Y_t = \beta_0 + \beta_1 \ln X_{2t} + \beta_3 \ln X_{3t} + \mu_t \quad \text{(3.2)}$$

Adapting this equation with the operational variable above resulted in:

$$lnGDP_t = \beta_0 + \beta_1 lnIC_t + \beta_2 lnWCC_t + \beta_3 lnGPE_t + \beta_4 lnTL_t + \mu_t \quad \text{(3.3)}$$

Where lnGDP is the natural logarithm of GDP, lnIC is the natural logarithm of investment credit, lnWCC is the natural logarithm of working capital credit, lnGPE is the natural logarithm of government capital expenditure, lnTL is the natural logarithm of total labor, and μ is residual.

3.5.2 Dynamic Model (Error Correction Model)

The short-run ECM for this research is:

$$\Delta Y_t = \beta_0 + \beta_1 \Delta x_t + ECT_{t-1} + e_t \quad \text{(3.4)}$$

Where ΔY_t is the first difference of the dependent variable at the t period, β_0 is constant, Δx_t is the first difference for the independent variable at the t period, ECT_{t-1} is the residual of the long-run equation at the t period, and e_t is the residual of the short-run equation.

Adapting equation (3.4) with the variables of this research resulted in:

$$\Delta GDP_t = \beta_0 + \beta_1 \Delta IC_t + \beta_2 \Delta WCC_t + \beta_3 \Delta GPE_t + \beta_4 \Delta TL_t + \beta_5 ECT_{t-1} + e_t \quad \text{(3.5)}$$

Where,

$$ECT_{t-1} = \Delta IC_{t-1} + \Delta WCC_{t-1} + \Delta GPE_{t-1} + \Delta TL_{t-1} + ECT_{t-1} + e_t. \quad \text{(3.6)}$$

Transforming the short-run ECM equation will result in the following equation:

$$\Delta(lnGDP_t) = \beta_0 + \beta_1 \Delta(lnIC_t) + \beta_2 \Delta(lnWCC_t) + \beta_3 \Delta(lnGPE_t) + \beta_4 \Delta(lnTL_t) + \beta_5 ECT_{t-1} + e_t \quad \text{(3.7)}$$

Where,

$$ECT_{t-1} = \Delta(lnIC_{t-1}) + \Delta(lnWCC_{t-1}) + \Delta(GPE_{t-1}) + \Delta(lnTL_{t-1}) + ECT_{t-1} + e_t \quad (3.8)$$

Where ΔlnGDP is the first difference of the natural logarithm of GDP, β_0 is constant, ΔlnIC the is the first difference of the natural logarithm of investment, ΔlnWCC is the first difference of the natural logarithm of working capital credit, ΔlnGPE is the first difference of the natural logarithm of government capital expenditure, ΔlnTL is the first difference of the natural logarithm of total labor, e_t is error variable, and ECT_{t-1} is the error correction term of the previous period.

3.5.3 Cointegration Test

This test checks if the variable being tested has a long-run relationship. A cointegration test is employed to do this. The cointegration test aims to check the residual stationarity of the long-run equation. This research used the Augmented Dickey-Fuller (ADF) test.

3.5.4 Econometrics Model Assumption Test

3.5.4.1 Normality Detection

Normality detection aims to examine whether the residual of the regression model is normally distributed. The method used is the Jarque-Bera (J-B) test. If the probability value of the Jarque-Bera is lower than α=0.05, then the residual is normally distributed; if the value is bigger than α=0.05, then the residual is not normally distributed.

- H_0: J-B probability > 0.05, residual is normally distributed.
- H_1: J-B probability < 0.05, residual is not normally distributed.

3.5.4.2 Classical Assumption Deviation Detection

A. Multicollinearity Test

The multicollinearity test aims to find whether, in the regression, there existed a correlation between independent variables. In this research, the Variance Inflation Factor (VIF) is used. The value of VIF used is 10.

- H_0: VIF < 10, there is no multicollinearity present.

- H_1: VIF > 10, there is multicollinearity present.

B. Heteroscedasticity Test

The heteroscedasticity test aims to find whether the data have heteroscedasticity tendencies. Heteroscedasticity means that all random variables have different finite variances. In this research, the Breusch-Pagan-Godfrey test is used. If the probability value is bigger than α=0.05, there is no heteroscedasticity. On the contrary, if the probability value is smaller than α=0.05, then heteroscedasticity exists.

- H_0: p > 0.05, there is no heteroscedasticity present
- H_1: p < 0.05, there is heteroscedasticity present

C. Autocorrelation Test

The autocorrelation test aims to find the relationship between observations in a time series. In this research, the Breusch-Godfrey Serial Correlation LM Test is used.

- H_0: p > 0.05, there is no autocorrelation present.
- H_1: p < 0.05, there is autocorrelation present.

3.5.5 Goodness of Fit Model (R^2)

The coefficient of determination measures the econometrics model's ability to explain the dependent variable variations. This is measured with the value of $0 < R^2 < 1$. If the value of R^2 is closer to 1, it means that the independent variables clearly explain the dependent variable. If the value is closer to the number zero, then it means that the independent variables do not clearly explain the dependent variable.

3.5.6 Significance Test

The significance test is done with a one-tail left where the hypothesis made has an already determined correlation between variables that are tested. The significance rate used is 5% and the degree of freedom (df) $= n - k$, where n is the amount of observation and k is the number of parameters including constant . This determines whether the null

hypothesis (H0) is rejected. This research employs these tests written below:

1. **Partial Significance Test (t-Test)**

   The T-test aims to measure the influence of individual independent variables in explaining the dependent variable with the assumption that other independent variables are constant. The partial test compares the test's t significance value with the significance value used in this research. The hypothesis tested is using a parameter (β).

   a. Investment Credit
      - H_0: $\beta 1 \leq 0$, investment credit did not influence GDP significantly.
      - H_1: $\beta 1 > 0$, investment credit did influence GDP significantly.

   b. Working Capital Credit
      - H_0: $\beta 2 \leq 0$, working capital credit did not influence GDP significantly.
      - H_1: $\beta 2 > 0$, working capital credit did influence GDP significantly.

   c. Government Capital Expenditure
      - H_0: $\beta 3 \leq 0$, government capital expenditure did not influence GDP significantly.
      - H_1:$\beta 3 > 0$, government capital expenditure did influence GDP significantly.

   d. Total Labor
      - H_0: $\beta 4 \leq 0$, total labor did not influence GDP significantly.
      - H_1: $\beta 4 > 0$, total labor did influence GDP significantly.

   The decision-making criteria are listed as follows:

- If the partial t-Statistic value < t-table, H_0 is accepted and H_1 is rejected.
- If the partial t-Statistic value > t-table, H_0 is rejected and H_1 is accepted.

2. Simultaneous Significance Test (F Test)

The F-test is used to see whether all independent variables in the research model influences the dependent variable simultaneously. The hypothesis of this research is as follows:

- H_0: $\beta 1 = \beta 2 = \beta 3 = \beta 4 = 0$; investment credit, working capital credit, government capital expenditure, and total labor did not have a significant influence on GDP.
- H_1: $\beta 1 \neq \beta 2 \neq \beta 3 \neq \beta 4 \neq 0$; investment credit, working capital credit, government capital expenditure, and total labor did have significant influence on GDP.

The decision-making criteria are listed as follows:

- If the F count < F-table, H_0 is accepted and H_1 is rejected.
- If the F count > F-table, H_0 is rejected and H_1 is accepted.

CHAPTER IV
RESULTS AND DISCUSSIONS

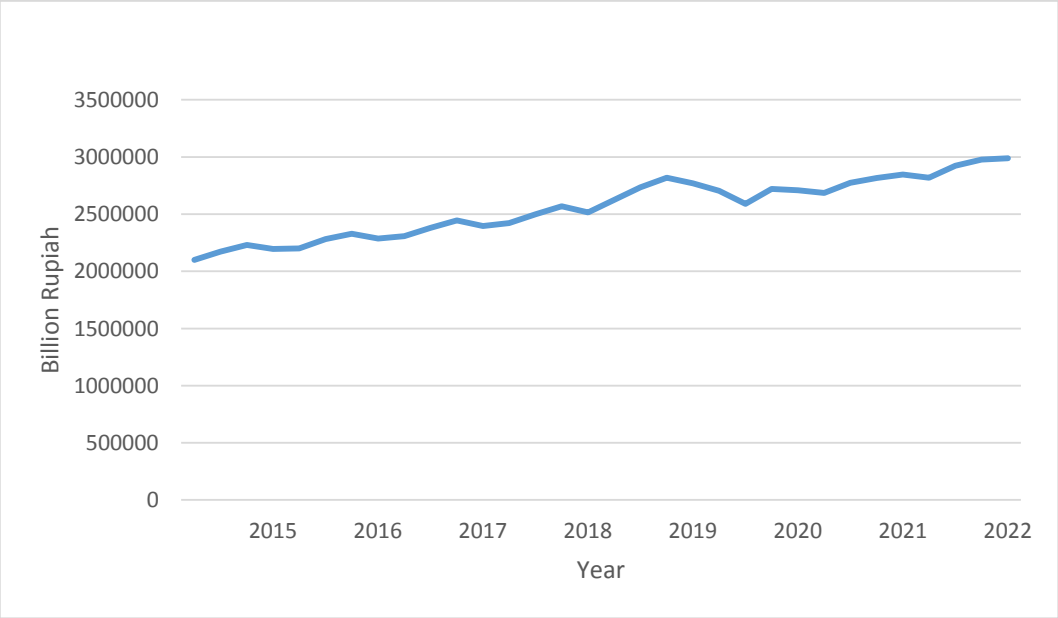
4.1 General Overview

4.1.1 Constant GDP

Gross Domestic Product (GDP) based on constant price is used as a proxy for economic growth. The data interval used is quarterly data.

Figure 4.1

GDP Based on 2010 Constant Price, 2015-2022 (Billion Rp)



Source: Badan Pusat Statistik

There is an upward trend with GDP growth for the timeframe used in this research. The COVID-19 outbreak caused a slight decrease from Q4 2019 to Q1 2020, but the GDP remained upward after that. As of 2023, Indonesia's GDP is Rp 12,301,393.60 billion, a Rp 591,145.7 billion increase from 2022. The biggest contributor to GDP in Indonesia is the Manufacturing sector, which contributes to Rp 2,507,799.80 in 2023. The Manufacturing sector's biggest contributor is Food and Beverages Manufacturing, valued at Rp 849,395.70 billion. The second largest contributor of GDP in 2023 was Wholesale and Retail Trade, Repair of

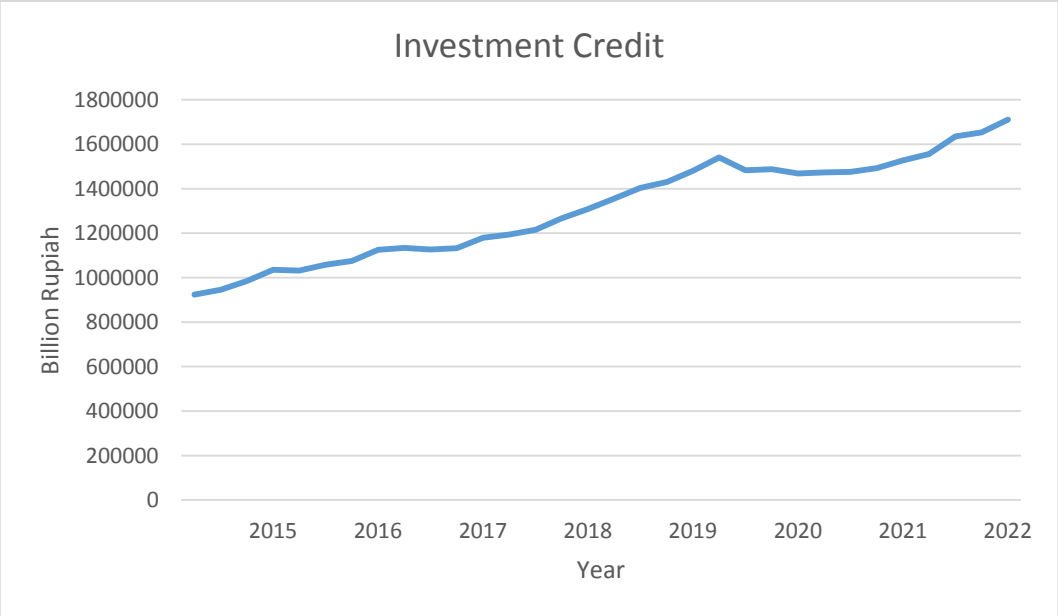
Motor Vehicles and Motorcycles which had a value of Rp 1,064,114 billion and its biggest contributor is the Wholesale and Retail Trade, non-vehicles and non-motorcycles at Rp 334,105 billion.

4.1.2 Investment Credit

Investment Credit acted as the first independent variable in this research. The data interval used is quarterly data.

Figure 4.2

Investment Credit, 2015-2022 (Billion Rp)



Source: Statistik Perbankan Indonesia, 2015-2022

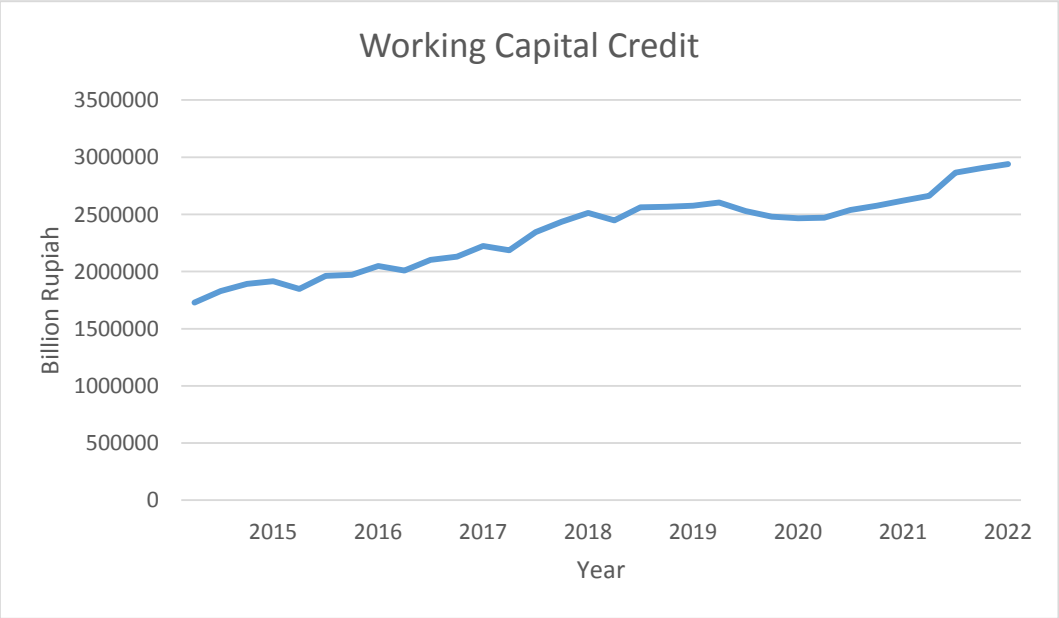
Investment credit continues to move upward during the research timeframe. There was a considerable rise from 2017 to 2019, with some decrease in 2020 due to COVID-19. After 2020, the value continues to rise. According to Bank Indonesia's Survey Perbankan, as of Q4 2023, the weighted net balance of investment credit is 85.5%. According to Badan Pusat Statistik (BPS), in 2023, the biggest receiver of investment credit is the Manufacturing sector at the value of Rp 306,615.71 billion, followed by the Agriculture, Forestry, and Fisheries sector at Rp 269,124.92 billion.

4.1.3 Working Capital Credit

Working Capital Credit is the second independent variable in this research. The data interval used is quarterly data.

Figure 4.3

Working Capital Credit, 2015-2022 (Billion Rp)



Source: Statistik Perbankan Indonesia, 2015-2022

Working capital had an upward trend in the timeframe used for this research, with a slight dip in 2020 due to COVID-19. According to Survey Perbankan Bank Indonesia, as of Q4 2023, working capital credit had a weighted net balance of 92.5%. BPS recorded that in 2023, the biggest demand for working capital credit came from the Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles sector, with a value of Rp 967,846.59 billion, followed by the Manufacturing sector, at Rp 775,580.30 billion.

4.1.4 Government Capital Expenditure

Government Capital Expenditure acted as the third independent variable in this research. The data interval used is quarterly data with some interpolation to fill data gaps.

Table 4.1

Government Capital Expenditure, 2015-2022 (Billion Rp)

Year	Government Capital Expenditure
2015	215343
2016	169474
2017	208656
2018	184127
2019	177841
2020	190919
2021	239632
2022	240570

Source: Portal APBN and Direktorat Jenderal Perbendaharaan, 2015-2022

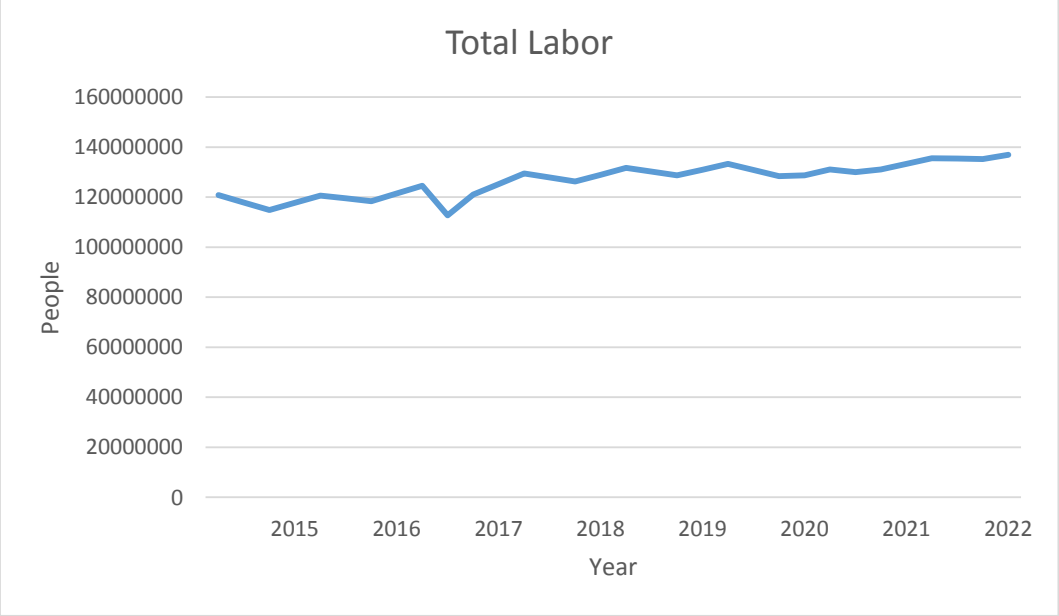
From the table above, we can see that government capital expenditures generally had an upward trend. There was a considerable decrease from 2015 to 2016, but then it moved upwards again. By Q4 2022, Indonesia's government capital expenditure reached Rp 240,570.30 billion, Rp 41,373.7 billion more than planned in the 2022 State Budget.

4.1.5 Total Labor

Total Labor acted as the fourth independent variable in this research. The data interval used is quarterly data, with interpolation to fill some data gaps, as BPS only provided data for February and August.

Figure 4.4

Total Labor, 2015-2022 (Million People)



Source: Badan Pusat Statistik, 2015-2022

The number of Indonesians of working age is generally stable throughout the research timeframe. According to the Indonesian Ministry of Labor, in 2023, the number of Indonesians who worked was 139.85 million, a 4.55 million increase from 2022. BPS reported that, in August of 2023, most of the working labor force worked in the Agriculture, Forestry, and Fisheries sector, followed by Wholesale and Retail trade; Repair of Motor Vehicles and Motorcycles, and lastly in the Manufacturing sector.

4.2 Result Analysis

This research used time series data from 2015 to 2022 using the Error Correction Method (ECM).

4.2.1 Error Correction Model (ECM)

4.2.1.1 Long-Run Estimation

Testing is done to see if there is a long-run relationship between the independent variables and the dependent variable. The result is displayed in the table below.

Table 4.2

Long-Run Regression Result

Variable	Coefficient	Std. Error	t-Statistic
LnIC	0.623502	0.194909	3.198933
LnWCC	0.426504	0.130209	3.275530
LnGPE	-0.031958	0.135371	-0.236077
LnTL	-0.004719	0.003592	-1.313848
C	1343291	330832.6	4.060334

R-Squared	: 0.964535
Adjusted R-Squared	: 0.959281
F-statistic	: 183.5784
Prob(F-statistic)	: 0.000000

The partial significance test is done by comparing the t-Statistic value with t-table. The test is done with a 5% significance and degree of freedom (df) n–k = 32–5 = 27, therefore we got t-table value at 1.70329. The significance test results are laid out below.

1. Investment credit had a positive impact on GDP. The coefficient value of IC is 0.623502, with the t-Statistic value at 3.198933. The t-Statistic value is bigger than t-table value of 1.70329 (3.198933>1.70392); therefore, a 1% increase in investment credit will increase GDP by 0,62%
2. Working capital credit had a positive impact on GDP. The coefficient value of WCC is 0.426504, with the t-Statistic value at 3.275530. The t-Statistic value is bigger than t-table value of 1.70329 (3.275530>1.70329); therefore, a 1% increase in working capital credit will increase GDP by 0.42%
3. Government capital expenditure had a negative effect on GDP. The coefficient value of GPE is -0.031958 and the t-Statistic value is -0.236077, which is smaller than t-table value of 1.70329 (-0.0236077<1.70329); therefore, a 1% increase in government capital expenditure will decrease GDP by 0.03%

4. Total labor had a negative effect on GDP. The coefficient value of TL is -0.004719, and the t-Statistic value of -1.31848, which is smaller than t-table value of 1.70329 (-1.31848<1.70329); therefore, a 1% increase in total labor will decrease GDP by 0.004%

The F-statistic test is done to see whether the independent variable influences the dependent variable simultaneously in the long run. The F-statistic value is 183.5784. With a 5% significance rate, the first degree of freedom (df1) = k–1 = 5–1 = 4 and the second degree of freedom (df2) = n–k = 32–5 = 27 we got the F-table value of 2.73. The value of F-statistic is bigger than F-table (183.5784 > 2.73). Therefore, investment credit, working capital credit, government capital expenditure, and total labor simultaneously influenced GDP in the long run.

The R^2 test is done to see whether the dependent variable can clearly explain the dependent variable in the long run. The R-squared value of 0.964335 showed that GDP can be clearly explained by investment credit, working capital credit, government capital expenditure, and total labor as much at 96,4%. Other variables outside of this research influence the other 3,6%.

4.2.1.2 Cointegration Test

Table 4.3

Cointegration Test Result

Residual		t-Statistic	Prob.
Augmented Dickey-Fuller test statistic		-4.876252	0.0026
Test critical values:	1%	-4.309824	
	5%	-3.574244	
	10%	-3.221728	

Source: Eviews 12 estimation

The table above shows that the ADF t-Statistic value is bigger than the t-Statistic critical value at 1%, 5%, and 10%. Also, the probability value of ADF t-Statistic value of 0,0026 is smaller than α of 0.05. Therefore, we can see that the residual is stationary and thus displays cointegration.

4.2.1.3 Short-Run Estimation

Testing is done to see whether there is a short-run relationship between the independent variable and the dependent variable.

Table 4.4

Short-Run Regression Result

Variable	Coefficient	Std. Error	t-Statistic
D(LnIC)	0.585566	0.464271	1.261257
D(LnWCC)	0.351867	0.212199	1.658197
D(LnGPE)	-0.021977	0.095116	-0.336188
D(LnTL)	-0.004943	0.003367	-1.468327
ECT (-1)	-0.700047	0.237133	-2.952121
C	3266.295	13994.24	0.233403

R-squared : 0.405359

Adjusted R-squared : 0.286431

F-statistic : 3.408433

Prob(F-statistic) : 0.017462

The partial significance test compares the t-statistic value with the t-table. It is done with a 5% significance and degree of freedom (df) n–k = 32–5 = 27. Therefore, we got a t-table value of 1.70329. The significance test is laid out below.

1. Investment credit had a positive relationship with GDP. The coefficient value is 0.585566 with the t-Statistic value of 1.261257, which is smaller than t-table value at 1.70329 (1.261257<1.70329); therefore, a 1% increase in investment credit will increase GDP by 0.58%
2. Working capital credit had a positive relationship with GDP. The coefficient value is 0.351867 with the t-Statistic value of 1.658197, which is smaller than t-table value of 1.70329 (1.658197<1.70329); therefore, a 1% increase in working capital credit will decrease GDP by 0.35%
3. Government capital expenditure had a negative effect on GDP. The coefficient value is -0.021977 with the t-Statistic value of -0.336188, which is smaller than t-table value of 1.70329 (-0,336188<1.70329); therefore, a 1% increase in government capital expenditure will decrease GDP by 0.02%

4. Total labor had a negative effect on GDP. The coefficient value is -0.004943 with the t-Statistic value of -1.468327, which is smaller than t-table value of 1.70329 (-1.468327<1.70329); therefore, a 1% increase in total labor will decrease GDP by 0.004%

The ECT coefficient in the short-run regression shows how much time is required to reach equilibrium in the absolute value. Therefore, the ECT coefficient of -0.700047 shows that in one period, the speed of adjustment GDP had in response to changes in the independent variables is 70%. Therefore, to reach 100% speed of adjustment, it will take less than two periods.

The F-statistic test is done to see whether the independent variable influences the dependent variable simultaneously in the long run. The F-statistic value is 183.5784. With a 5% significance rate, the first degree of freedom (df1) = k–1 = 5–1 = 4 and the second degree of freedom (df2) = n–k = 32–5 = 27, we got the F-table value of 2.73. The value of F-statistic is bigger than F-table (3.408433 > 2.73), therefore investment credit, working capital credit, government capital expenditure, and total labor simultaneously influenced GDP in the short run.

The R^2 test is used to see how clearly the independent variable explains the dependent variable. The R-squared value of 0.405359 showed that in the short run, investment credit, working capital credit, government capital expenditure, and total labor could influence GDP up to 40,5%. The other 59,5% are from variables outside of this research.

4.2.2 Econometrics Model Assumption Test

4.2.2.1 Normality Detection

A normality test is done to see if a regression model, an independent variable, a dependent variable, or both are normally distributed. The long-run and short-run results are laid out in the table below.

Table 4.5

Long-Run and Short-Run Normality Detection Result

Timeframe	Jarque-Bera	Probability
Long run	4.049988	0.131995
Short run	2.908221	0.233608

Source: Eviews 12 estimation

The long-run probability is 0.131995, which is bigger than the α value of 0.05. Therefore, the data is normally distributed in the long run. The short-run probability is 0.233608, which is bigger than the α value of 0.05. Therefore, the data is normally distributed in the short run.

4.2.2.2 Classical Assumption Deviation Detection

A. Multicollinearity test

The multicollinearity test is used to see a possible correlation between independent variables in a regression model. To check this, the VIF value must be smaller than 10. Otherwise, multicollinearity is considered to be present. The results for both the long-run and short-run multicollinearity test are laid in the table below:

Table 4.6

Long-Run Multicollinearity Test Result

Variable	Coefficient Variable	Uncentered VIF	Centered VIF
IC	0.037990	785.6844	22.30149
WCC	0.016954	1110.731	21.50702
GPE	0.018325	3.024978	1.075545
TL	129E-05	2437.321	6.240878
C	1.09E+11	1281775	NA

Source: Eviews 12 estimation

From the table above, two variables display multicollinearity in the long run, and two variables do not. The two variables that display multicollinearity are investment credit and working capital credit, with VIF values of 22.30149 and 21.5070, which are greater than 10. Government capital expenditure and total labor do not display multicollinearity because their VIF values are below 10.

According to Gujarati (2008), even if multicollinearity is high, the OLS estimators still retain the property of BLUE (Best Linear Unbiased Estimator) or BUE (Best Unbiased Estimator) if the normality assumption is added.

Table 4.7

Short-Run Multicollinearity Test Result

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
D(IC)	0.215548	3.368494	1.802483
D(WCC)	0.045028	2.923895	2.148609
D(GPE)	0.00947	1.139881	1.137433
D(TL)	1.13E-05	1.505932	1.471363
ECT(-1)	0.056232	1.500492	1.500187
C	1.96E+08	2.209599	NA

Source: Eviews 12 estimation

In the table, all independent variables (investment credit, working capital credit, government capital expenditure) and the residual have a VIF value below 10. This means that in the short run, all independent variables did not correlate with each other.

B. Heteroscedasticity test

The heteroscedasticity test detects variances from the residual of all observations in a regression model. To pass this test, the value of Prob. Chi-Square of the Obs*R-squared needs to be bigger than 0.05. If the value is bigger than 0.05, we can assume there is no heteroscedasticity; however, if the value is smaller than 0.05, we can assume heteroscedasticity exists.

Table 4.8

Long-Run Heteroscedasticity Test Result

F-Statistic	0.356117	**Prob. F(4,27)**	0.8375
Obs*R-Squared	1.603652	**Prob. Chi-Square(4)**	0.8081
Scaled explained SS	1.731518	**Prob. Chi-Square(4)**	0.7850

Source: Eviews 12 estimation

From the table, we can see that the Prob. Chi-Square value of 0,8081 is bigger than 0.05. Therefore, no heteroscedasticity was detected in the long run.

Table 4.9

Short-Run Heteroscedasticity Test Result

F-Statistic	0.857411	**Prob. F(5,25)**	0.5230
Obs*R-Squared	4.537798	**Prob. Chi-Square(5)**	0.4748
Scaled explained SS	3.510801	**Prob. Chi-Square(5)**	0.6218

Source: Eviews 12 estimation

From the table, we can see that the Prob. Chi-Square value of 0,4748 is bigger than 0.05; therefore, there is no short-run heteroscedasticity.

C. Autocorrelation test

The autocorrelation test aims to see if there is a correlation between the variables in the estimation model specified by time or space. For an equation to be considered free of autocorrelation, the Prob. Chi-Square value of Obs*R-Square must be above 0.05. If the value is below 0.05, then autocorrelation happens.

Table 4.10

Long-Run Autocorrelation Test Result

F-statistic	2.118152	**Prob. F(2;25)**	0.1413
Obs*R-Squared	4.636760	**Prob. Chi-Square(2)**	0.0984

Source: Eviews 12 estimation

The Prob. The Chi-Square value of 0,0984 is bigger than 0.05; therefore, autocorrelation does not occur in the long run.

Table 4.11

Short-Run Autocorrelation Test

F-statistic	1.412954	**Prob. F(2;25)**	0.2638
Obs*R-Squared	3.392065	**Prob. Chi-Square(2)**	0.1834

Source: Eviews 12 estimation

The Prob. Chi-square value of 0,1834 is bigger than 0.05; therefore, autocorrelation does not occur in the short run.

4.3 Result Interpretation

4.3.1 The Influence of Investment Credit on GDP

The t-Statistic value of investment credit in the long-run is 3.198933. The t-Statistic value is bigger than t-table value of 1.70329 (3.198933>1.70392), shows that investment credit significantly influenced GDP in the long run. The long-run investment credit coefficient of 0.623502 means that for every 1% increase in investment credit in the long-run, GDP will increase by 0.62%. Therefore, we can conclude that investment credit positively and significantly impacts GDP in the long run.

The t-Statistic value of investment credit is 1.261257, which is smaller than t-table value at 1.70329 (1.261257<1.70329), showing that investment credit insignificantly influenced GDP in the short run. The short-run coefficient of 0.585566 means that for every 1% increase in investment credit, GDP will increase by 0.58%. Therefore, we can conclude that investment credit positively and insignificantly impacts GDP in the short run.

The result of this research fulfills H_0, where investment credit positively impacts economic growth. According to the research of Nurjannah and Nurhayati (2017), investment credit and working capital credit influence economic growth. This is in line with the research findings. The purpose of investment credit is to help businesses purchase capital goods such as machinery or buildings. This, in turn, will boost productivity, which will then increase output and later increase economic growth. Investment credit can be considered productive credit because the credit is used to add more value to the production process, which will then generate income.

1.3.2 The Influence of Working Capital Credit on GDP

The long-run coefficient of 0.426504 means that for every 1% increase in working capital credit, the GDP increases by 0.42% in the long run. The t-Statistic value of 3.275530 is bigger than t-table value of 1.70329 (3.198933>1.70392), which shows that working capital credit significantly influenced GDP in the long run. Therefore, we can conclude that working capital credit positively and significantly impacts GDP in the long run.

The short-run coefficient of 0.351867 means that for every 1% increase in working capital credit, the GDP increases by 0.35% in the short run. The t-Statistic value of 1.658197 is smaller than t-table value of 1.70329 (1.658197<1.70329), which shows that working capital credit insignificantly influenced GDP in the short run. Therefore, we can conclude that working capital credit positively and insignificantly influenced GDP in the short run.

The results of this research fulfill the H0, where working capital credit has a positive impact on economic growth. In their research, Wiguna and Viverita (2021) found that working capital credit strongly correlates to economic growth. Working capital credit is used to operate a business, such as to procure production materials and business expenses. This activity boosts business productivity, which then increases output and, therefore, economic growth.

4.3.3 The Influence of Government Capital Expenditure on GDP

The long-run coefficient of -0.031958 means that for every 1% percent increase in government capital expenditure, the GDP decreases by 0.03%. The t-Statistic value -0.236077 is smaller than the t-table value of 1.70329 (-0.0236077<1.70329), showing that government capital expenditure insignificantly influences GDP. Therefore, we can conclude that government capital expenditure negatively and insignificantly impacts GDP in the long run.

The short-run coefficient of -0.021977 means that for every 1% increase in government capital expenditure, the GDP decreases by 0.02%. The t-Statistic value -0,031977 is smaller than t-table value of 1.70329 (-0,336188<1.70329), showing that government capital expenditure insignificantly influences GDP. Therefore, we can conclude that government capital expenditure negatively and insignificantly impacts GDP in the short run.

The result of this research does not fulfill H_0, where government capital expenditure positively impacts economic growth. In their research, Buthelezi (2023) found out that the government expenditure in South Africa from 1994 to 2021 caused a reduction in economic growth both in the long run and short run instead of increasing it, which is against the Keynesian viewpoint where government expenditure is expected to increase economic growth.

4.3.4 The Influence of Total Labor on GDP

The long-run coefficient of -0,004719 means that for every 1% increase in total labor, the GDP will decrease by 0.004%. The t-Statistic value of -1.313848 is lower than t-table value of 1.70329 (-1.313848<1.70329), showing that total labor did not significantly influence GDP. Therefore, we can conclude that total labor negatively and insignificantly influences GDP in the long run.

The short-run coefficient of -0.004943 means that for every 1% increase in total labor, the GDP will decrease by 0.004%. The t-Statistic value of -1.468327 is lower than t-table value of 1.70329 (-1.468327<1.70329), showing that total labor did not significantly influence GDP. Therefore, we can conclude that total labor negatively and insignificantly influences GDP in the short run.

The result of this research does not fulfill H_0, where total labor influences economic growth positively. In their paper, Sander and Pui (2020) find that labor productivity in Indonesia is mostly driven by improvements within the business sector instead of structural changes. They found that because most new jobs are in low-value-added services such as restaurants, hotels, and trade, they are not more productive than sector-shedding jobs, mostly agriculture. Productive labor can be found in higher-paying sectors, such as finance, real estate, insurance, etc. Unfortunately, these higher-paying job sectors required higher education to enter, making most Indonesians unable to apply as the average schooling time in Indonesia is 9.13 years in 2023.

CHAPTER V
CONCLUSION

5.1 Conclusion of Research

Based on the analysis written in Chapter 4, the effect of bank credit towards economic growth in Indonesia is positive and significant. Both investment credit and working capital credit displays a positive and significant influence to Indonesian economic growth in the long run, while in the short run investment credit and working capital credit had a positive and insignificant effect on economic growth. On the other hand, government capital expenditure and total labor had a negative and insignificant influence towards economic growth in Indonesia both in the long run and in the short run.

5.2 Suggestions

Based on the conclusion laid above, some suggestions that this research can offer are:

1. The Indonesian government needs to promote the use of investment credit, for example, by easing regulations to make it easier for people to take investment credit.
2. Working capital credit needs to be promoted even further to the masses, for example, through socialization with business owners or easing the requirements to take one.

5.3 Limitations of Research

The limitation of this research was data availability; for example, there are some empty gaps in the data set or the data of a variable is in a different unit with the data of other variables.

BIBLIOGRAPHY

- *Realisasi APBN / i Account - DJPb | Direktorat Jenderal Perbendaharaan Kementerian Keuangan RI*. (n.d.). https://djpb.kemenkeu.go.id/portal/id/berita/lainnya/realisasi-apbn.html

Ananzeh, I. E. N. (2016). Relationship between Bank Credit and Economic Growth: Evidence from Jordan. *International Journal of Financial Research*, *7*(2). https://doi.org/10.5430/ijfr.v7n2p53

Badan Pusat Statistik, Badan Pusat Statistik, & Badan. (2024, May 31). *Posisi Kredit Investasi Perbankan Menurut Sektor Ekonomi, 2023*. Badan Pusat Statistik. Retrieved May 29, 2024, from https://www.bps.go.id/id/statistics-table/2/NjMzlzl=/posisi-kredit-investasi-perbankan-menurut-sektor-ekonomi--format-baru---milyar-rupiah-.html

Badan Pusat Statistik. (2020). PDB Indonesia Triwulanan 2016-2020. *Badan Pusat Statistik*. https://www.bps.go.id/publication/2020/10/16/54be7f82b7d3aa22f5e2c144/pdb-indonesia-triwulanan-2016-2020.html

Balago, G. S. (2014). Nexus between Bank Credit and Economic Growth in Nigeria: Evidence from VEC Model. *OALib*, *01*(08), 1–12. https://doi.org/10.4236/oalib.1100952

Belinga, T., Zhou, J., Doumbe Doumbe, E., Gahe Zimy Samuel, Y., & Koffi Yao Stéphane, L. (2016). Causality Relationship between Bank Credit and Economic Growth: Evidence from a Time Series Analysis on a Vector Error Correction Model in Cameroon. *Procedia - Social and Behavioral Sciences*, *235*, 664–671. https://doi.org/10.1016/j.sbspro.2016.11.061

Bezemer, D. J. (2014). Schumpeter might be right again: the functional differentiation of credit. *Journal of Evolutionary Economics*, *24*(5), 935–950. https://doi.org/10.1007/s00191-014-0376-2

Buthelezi, E. M. (2023). Impact of government expenditure on economic growth in different states in South Africa. *Cogent Economics & Finance*, *11*(1). https://doi.org/10.1080/23322039.2023.2209959

Case, K. E., Fair, R. C., & Oster, S. M. (2011). *Principles of Economics* (D. Battista, Ed.; 10th ed.). Pearson College Div.

Disbudak, C. (2010). *Analyzing the bank credit-economic growth nexus in Turkey*. 34–48.

Froyen, R. T. (2013). *Macroeconomics: Theories and Policies* (D. Battista, Ed.; 10th ed.). Pearson Education Limited.

Garcia-Escribano, M., & Han, F. (2015). *Credit Expansion in Emerging Markets: Propeller of Growth? IMF Working Paper Western Hemisphere Department Credit Expansion in Emerging Markets: Propeller of Growth?*

Gil Sander, F., & Shen Yoong, P. (2020). *Structural Transformation and Labor Productivity in Indonesia: where are all the good jobs?*

Ho, N. W. (2005). Bank Credit and Economic Growth in Macao. *Monetary Authority of Macao*, *2006*, 1–39.

Indonesia, B. (n.d.). *Survei perbankan Triwulan IV 2023*. https://www.bi.go.id/id/publikasi/laporan/Pages/Survei-Perbankan-TwIV-2023.aspx

Indonesia, B. P. S. (n.d.-a). *Penduduk Berumur 15 tahun ke atas menurut jenis kegiatan - Tabel Statistik*. Badan Pusat Statistik Indonesia. https://www.bps.go.id/id/statistics-table/2/NTI5IzI=/penduduk-berumur-15-tahun-ke-atas-menurut-jenis-kegiatan.html

Indonesia, B. P. S. (n.d.-b). *Produk Domestik Bruto Atas Dasar Harga Konstan 2010 Menurut Lapangan Usaha (miliar rupiah), 2022 - Tabel Statistik*. Badan Pusat Statistik Indonesia. https://www.bps.go.id/id/statistics-table/3/VWtsTFNuRlpabk16TWxKaVNXcE1PRXhKT0RJclFUMDkjMw==/produk-domestik-bruto-atas-dasar-harga-konstan-2010-menurut-lapangan-usaha--miliar-rupiah-.html?year=2022

Indonesia, B. P. S. (n.d.-c). *[SerI 2010] PDB menurut lapangan usaha seri 2010 - Tabel statistik*. Badan Pusat Statistik Indonesia. https://www.bps.go.id/id/statistics-table/2/NjUjMg==/-seri-2010--pdb-menurut-lapangan-usaha-seri-2010--milyar-rupiah-.html

KLASIFIKASI JENIS BELANJA. (n.d.). https://jdih.kemenkeu.go.id/fulltext/2011/101~pmk.02~2011perlamp%20iii.htm

Loayza, N., & Ranciere, R. (2006). Financial Development, Financial Fragility, and Growth. In *Journal of Money, Credit, and Banking* (Vol. 38, Issue 4). https://doi.org/10.1353/mcb.2006.006

Mishkin, F. S. (2016). *The Economics of Money, Banking, and Financial Markets* (11th ed.). Pearson Education Limited.

Mishra, P. K., & Pradhan, K. B. D. (2009). Credit Market Development and Economic Growth in India. *Middle Eastern Finance and Economics*, *5*, 92–106.

Nurjannah, N., & Nurhayati, N. (2017). Pengaruh Penyaluran Kredit Investasi, Kredit Modal Kerja dan Kredit Konsumtif Terhadap Pertumbuhan Ekonomi Indonesia. *Jurnal Samudra Ekonomi Dan Bisnis*, *8*(1), 590–601. https://doi.org/10.33059/jseb.v8i1.209

Puatwoe, J. T., & Piabuo, S. M. (2017). Financial sector development and economic growth: evidence from Cameroon. *Financial Innovation*, *3*(1). https://doi.org/10.1186/s40854-017-0073-x

Raz, A. F. (2013). The nexus between bank credit development and economic growth in Indonesia. *DLSU Business and Economics Review*, *23*(1), 93–104.

Satudata Kemnaker | portal data ketenagakerjaan RI. (n.d.). https://satudata.kemnaker.go.id/infografik/59

Solow, R. (1999). Neoclassical growth theory. In J. B. Taylor & M. Woodford (Eds.), *Handbook of Macroeconomics* (Vols. 1, Part A, Issue 09, pp. 637–667). Elsevier. https://EconPapers.repec.org/RePEc:eee:macchp:1-09

Statistik Perbankan Indonesia. (n.d.). https://ojk.go.id/id/kanal/perbankan/data-dan-statistik/statistik-perbankan-indonesia/default.aspx

Todaro, M. P., & Smith, S. C. (2011). *Economic Development, 11th Edition (The Pearson Series in Economics) -Prentice Hall (2011)*. 146–147.

Undang-Undang Nomor 10 Tahun 1998 tentang Perubahan atas Undang-Undang Nomor 7 Tahun 1992 Tentang Perbankan, 1 (1998).

Wiguna, A., & Viverita (2021). CO-MOVEMENT BETWEEN BANK LOAN GROWTH AND ECONOMIC GROWTH IN INDONESIA USING WAVELET COHERENCE ANALYSIS. In *Proceedings of the 7th Annual ECOFI Symposium (AES2021)* (pp. 1-10)

APPENDIX

Unit Root Test

Level

Null Hypothesis: Unit root (individual unit root process)
Series: GDP, IC, WCC, GPE, TL
Date: 05/26/24 Time: 01:31
Sample: 2015Q1 2022Q4
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Total number of observations: 148
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	21.2272	0.0196
ADF - Choi Z-stat	-2.18339	0.0145

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results GROUP01

Series	Prob.	Lag	Max Lag	Obs
GDP	0.1734	0	6	31
IC	0.7260	0	6	31
WCC	0.0628	4	6	27
GPE	0.1919	3	6	28
TL	0.0162	0	6	31

1st difference

Null Hypothesis: Unit root (individual unit root process)
Series: GDP, IC, WCC, GPE, TL
Date: 05/26/24 Time: 01:34
Sample: 2015Q1 2022Q4
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Total number of observations: 147
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	325.840	0.0000
ADF - Choi Z-stat	-13.0829	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(GROUP01)

Series	Prob.	Lag	Max Lag	Obs
D(GDP)	0.0007	0	6	30
D(IC)	0.0055	0	6	30
D(WCC)	0.0001	0	6	30
D(GPE)	0.0000	2	6	28
D(TL)	0.0000	1	6	29

Cointegration

Null Hypothesis: RESIDUAL has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.876252	0.0026
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESIDUAL)
Method: Least Squares
Date: 05/26/24 Time: 02:57
Sample (adjusted): 2015Q4 2022Q4
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESIDUAL(-1)	-1.394429	0.285963	-4.876252	0.0001
D(RESIDUAL(-1))	0.556487	0.221385	2.513658	0.0191
D(RESIDUAL(-2))	0.432804	0.185232	2.336549	0.0281
C	-19515.76	19955.50	-0.977964	0.3378
@TREND("2015Q1")	1089.132	1058.713	1.028733	0.3139

R-squared	0.533557	Mean dependent var	-1157.634
Adjusted R-squared	0.455817	S.D. dependent var	63160.29
S.E. of regression	46592.57	Akaike info criterion	24.49186
Sum squared resid	5.21E+10	Schwarz criterion	24.72760
Log likelihood	-350.1319	Hannan-Quinn criter.	24.56569
F-statistic	6.863314	Durbin-Watson stat	1.873456
Prob(F-statistic)	0.000785		

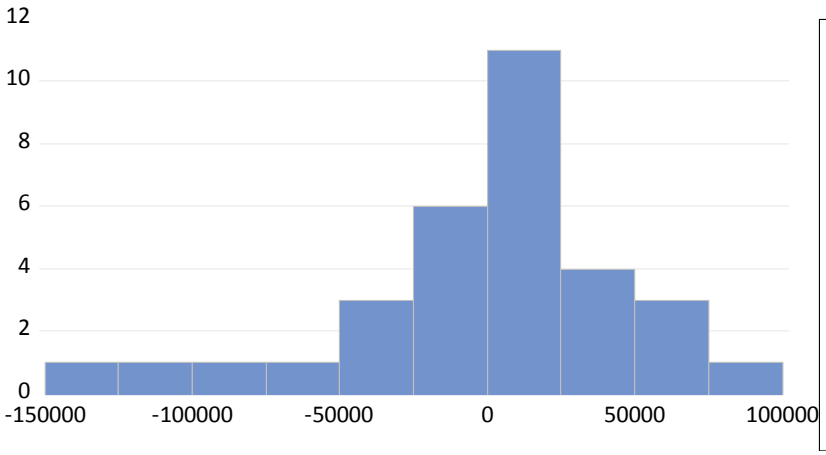
Long-run Regression

Dependent Variable: GDP
Method: Least Squares
Date: 05/26/24 Time: 21:15
Sample: 2015Q1 2022Q4
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IC	0.623502	0.194909	3.198933	0.0035
WCC	0.426504	0.130209	3.275530	0.0029
GPE	-0.031958	0.135371	-0.236077	0.8152
TL	-0.004719	0.003592	-1.313848	0.2000
C	1343291.	330832.6	4.060334	0.0004

R-squared	0.964535	Mean dependent var	2557308.
Adjusted R-squared	0.959281	S.D. dependent var	259046.9
S.E. of regression	52273.00	Akaike info criterion	24.70895
Sum squared resid	7.38E+10	Schwarz criterion	24.93797
Log likelihood	-390.3432	Hannan-Quinn criter.	24.78486
F-statistic	183.5784	Durbin-Watson stat	1.514957
Prob(F-statistic)	0.000000		

Normality test



Series: Residuals	
Sample 2015Q1 2022Q4	
Observations 32	
Mean	-8.15e-10
Median	6324.222
Maximum	99051.47
Minimum	-137882.4
Std. Dev.	48784.12
Skewness	-0.701734
Kurtosis	4.033328
Jarque-Bera	4.049988
Probability	0.131995

Multicollinearity test

Variance Inflation Factors
Date: 05/26/24 Time: 22:57
Sample: 2015Q1 2022Q4
Included observations: 32

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
IC	0.037990	785.6844	22.30149
WCC	0.016954	1110.731	21.50702
GPE	0.018325	3.024978	1.075545
TL	1.29E-05	2437.321	6.240878
C	1.09E+11	1281.775	NA

Heteroscedasticity test

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

F-statistic	0.356117	Prob. F(4,27)	0.8375
Obs*R-squared	1.603652	Prob. Chi-Square(4)	0.8081
Scaled explained SS	1.731518	Prob. Chi-Square(4)	0.7850

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/26/24 Time: 21:26
Sample: 2015Q1 2022Q4
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.87E+09	2.70E+10	0.106380	0.9161
IC	1260.445	15885.91	0.079344	0.9373
WCC	3191.674	10612.58	0.300744	0.7659
GPE	-475.2749	11033.34	-0.043076	0.9660
TL	-76.02392	292.7300	-0.259707	0.7971

R-squared	0.050114	Mean dependent var	2.31E+09
Adjusted R-squared	-0.090610	S.D. dependent var	4.08E+09
S.E. of regression	4.26E+09	Akaike info criterion	47.32577
Sum squared resid	4.90E+20	Schwarz criterion	47.55479
Log likelihood	-752.2123	Hannan-Quinn criter.	47.40168
F-statistic	0.356117	Durbin-Watson stat	1.963228
Prob(F-statistic)	0.837488		

Autocorrelation test

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

F-statistic	2.118152	Prob. F(2,25)	0.1413
Obs*R-squared	4.636760	Prob. Chi-Square(2)	0.0984

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/26/24 Time: 21:18
Sample: 2015Q1 2022Q4
Included observations: 32
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IC	0.025781	0.189457	0.136080	0.8928
WCC	-0.044304	0.127051	-0.348710	0.7302
GPE	-0.115744	0.141889	-0.815736	0.4224
TL	0.001689	0.003663	0.461013	0.6488
C	-133283.9	337606.3	-0.394791	0.6963
RESID(-1)	0.384461	0.211873	1.814585	0.0816
RESID(-2)	-0.324847	0.213762	-1.519663	0.1411

R-squared	0.144899	Mean dependent var	-8.15E-10
Adjusted R-squared	-0.060326	S.D. dependent var	48784.12
S.E. of regression	50234.04	Akaike info criterion	24.67741
Sum squared resid	6.31E+10	Schwarz criterion	24.99804
Log likelihood	-387.8386	Hannan-Quinn criter.	24.78369
F-statistic	0.706051	Durbin-Watson stat	2.228761
Prob(F-statistic)	0.647656		

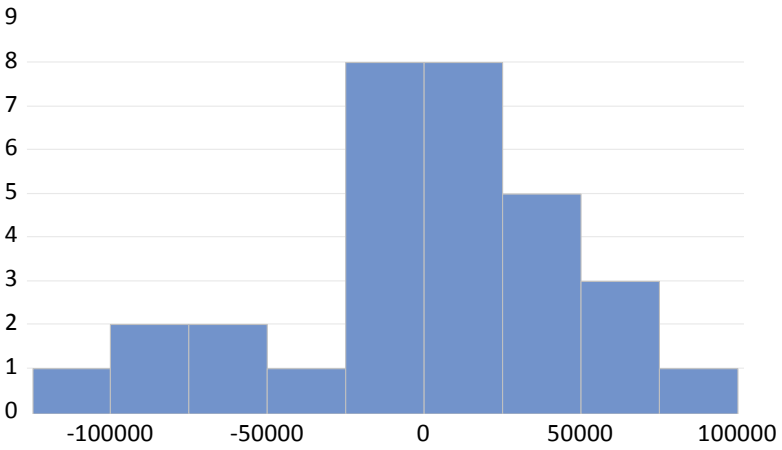
Short-run Regression

Dependent Variable: D(GDP)
Method: Least Squares
Date: 05/26/24 Time: 03:18
Sample (adjusted): 2015Q2 2022Q4
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IC)	0.585566	0.464271	1.261257	0.2189
D(WCC)	0.351867	0.212199	1.658197	0.1098
D(GPE)	-0.031977	0.095116	-0.336188	0.7395
D(TL)	-0.004943	0.003367	-1.468327	0.1545
RESIDUAL(-1)	-0.700047	0.237133	-2.952121	0.0068
C	3266.295	13994.24	0.233403	0.8173

R-squared	0.405359	Mean dependent var	28659.22
Adjusted R-squared	0.286431	S.D. dependent var	62051.95
S.E. of regression	52417.17	Akaike info criterion	24.74384
Sum squared resid	6.87E+10	Schwarz criterion	25.02139
Log likelihood	-377.5295	Hannan-Quinn criter.	24.83431
F-statistic	3.408433	Durbin-Watson stat	1.847885
Prob(F-statistic)	0.017462		

Normality test



Series: Residuals
Sample 2015Q2 2022Q4
Observations 31

Mean	3.40e-12
Median	7003.787
Maximum	84910.64
Minimum	-124910.3
Std. Dev.	47850.11
Skewness	-0.725899
Kurtosis	3.379219
Jarque-Bera	2.908221
Probability	0.233608

Multicollinearity test

Variance Inflation Factors
Date: 05/26/24 Time: 03:21
Sample: 2015Q1 2022Q4
Included observations: 31

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
D(IC)	0.215548	3.368494	1.802483
D(WCC)	0.045028	2.923895	2.148609
D(GPE)	0.009047	1.139881	1.137433
D(TL)	1.13E-05	1.505932	1.471363
RESIDUAL(-1)	0.056232	1.500492	1.500187
C	1.96E+08	2.209599	NA

Heteroscedasticity test

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

F-statistic	0.857411	Prob. F(5,25)	0.5230
Obs*R-squared	4.537798	Prob. Chi-Square(5)	0.4748
Scaled explained SS	3.510801	Prob. Chi-Square(5)	0.6218

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/26/24 Time: 03:20
Sample: 2015Q2 2022Q4
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.24E+09	9.39E+08	3.453521	0.0020
D(IC)	-34193.70	31144.68	-1.097899	0.2827
D(WCC)	-6817.855	14234.92	-0.478953	0.6361
D(GPE)	7260.069	6380.639	1.137828	0.2660
D(TL)	141.0385	225.8401	0.624506	0.5380
RESIDUAL(-1)	-1676.246	15907.61	-0.105374	0.9169

R-squared	0.146381	Mean dependent var	2.22E+09
Adjusted R-squared	-0.024343	S.D. dependent var	3.47E+09
S.E. of regression	3.52E+09	Akaike info criterion	46.97121
Sum squared resid	3.09E+20	Schwarz criterion	47.24876
Log likelihood	-722.0538	Hannan-Quinn criter.	47.06168
F-statistic	0.857411	Durbin-Watson stat	1.634052
Prob(F-statistic)	0.522989		

Autocorrelation test

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

F-statistic	1.412954	Prob. F(2,23)	0.2638
Obs*R-squared	3.392065	Prob. Chi-Square(2)	0.1834

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/26/24 Time: 03:19
Sample: 2015Q2 2022Q4
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IC)	0.060953	0.486807	0.125210	0.9014
D(WCC)	0.025102	0.223946	0.112089	0.9117
D(GPE)	-0.077719	0.105770	-0.734784	0.4699
D(TL)	-0.000209	0.003410	-0.061232	0.9517
RESIDUAL(-1)	-2.054388	1.682819	-1.220802	0.2345
C	-2167.955	13890.83	-0.156071	0.8773
RESID(-1)	2.132191	1.652121	1.290578	0.2097
RESID(-2)	0.258412	0.494091	0.523005	0.6060

R-squared	0.109421	Mean dependent var	3.40E-12
Adjusted R-squared	-0.161624	S.D. dependent var	47850.11
S.E. of regression	51572.21	Akaike info criterion	24.75699
Sum squared resid	6.12E+10	Schwarz criterion	25.12705
Log likelihood	-375.7333	Hannan-Quinn criter.	24.87762
F-statistic	0.403701	Durbin-Watson stat	2.060145
Prob(F-statistic)	0.890161		