Analyzing the Impact of Public Health Insurance Claims and Government Health Expenditure on Indonesia's Economy

A Thesis

Submitted to the Master's Study Program of Economics at the Faculty of Economics and Business in partial fulfillment of the requirements for the degree of

Master of Arts (M.A.)

by:

Wafdah Layli Rizqiyah

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UNIVERSITAS ISLAM INTERNASIONAL INDONESIA

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ABSTRACT

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This study contains various discussions related to the impact of government spending in the health sector, as well as the impact of public health insurance claim costs on economic growth in Indonesia during the period 2014 - 2023. Therefore, in conducting various analyses on short-term and long-term relationships related to these variables, an approach called Auto-Regressive Distributed Lag (ARDL) is needed. In addition, as a control variable applied to the urban population and the Consumer Price Index (CPI), this variable is used with the aim of separating the various influences of independent variables related to economic growth in Indonesia.

The results show that public health insurance claims have a positive and significant impact on GDP per capita and Real GDP in the short and long run. This indicates that increased access to health services through BPJS Kesehatan contributes to increased labor productivity, which in turn boosts real economic growth. Government health expenditure does not show a significant effect on GDP per capita, either in the short or long run. This suggests that government health spending may not have been managed effectively to make a strong contribution to sustainable economic growth. This finding emphasizes the importance of improvements in the allocation and efficiency of health spending to support economic growth.

Control variables such as urban population and CPI also play an important role in this analysis. Urbanization impact on GDP per capita is more variable, with potential negative impacts in the short term due to pressure on infrastructure and public services. Inflation, as measured by the CPI, has a significant impact in the short term on GDP per capita but the effect does not persist in the long term, highlighting the need for prudent inflation management to maintain economic stability.

Overall, this study concludes that improving access and efficiency of health insurance claims through BPJS Kesehatan can be a key driver of economic growth in Indonesia, particularly through improving labor productivity and individual welfare. However, to achieve sustainable economic growth, more comprehensive policies are needed, including reforms in the management of government health spending, better management of urbanization, and effective inflation control. The findings provide important insights for policymakers in formulating more effective and sustainable economic strategies.

Keywords: *Health Expenditure, Public Insurance Claims, Economic Growth, ARDL, GDP per capita.*

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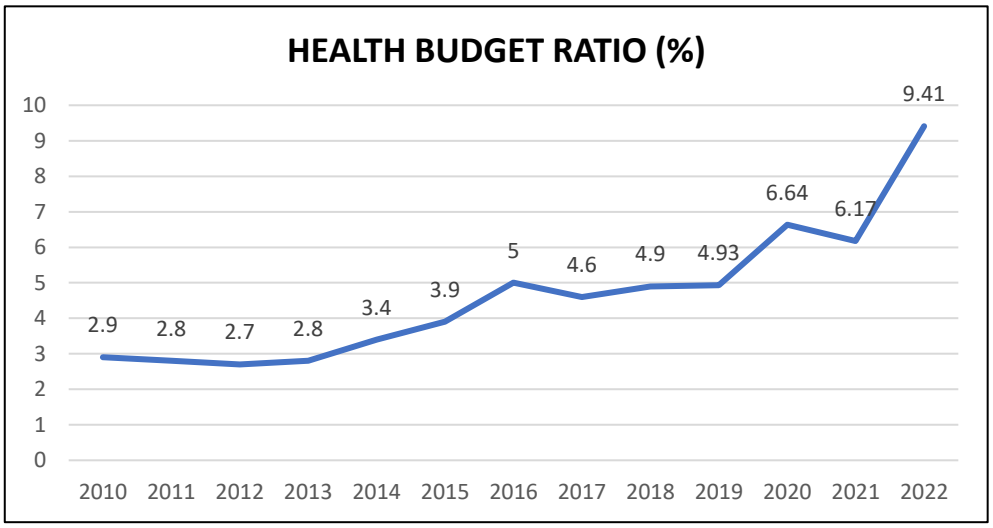
CHAPTER 1
INTRODUCTION

1.1 Research Background

The allocation of health resources in Indonesia has shown a significant increase over time. The increase in the health budget ratio (calculated as the ratio of government health budget to total state expenditure) is evidence of the government's seriousness towards the development and improvement of public health infrastructure. From 2010 to 2013, the trend of the government health budget ratio tended to be flat, only in the range of 2.7% - 2.9% (Figure 1.1). Three years later there was an increase in the health budget ratio from 3.4% to 5%. Along with this increase, in January 2014, the government established the Health Social Security Organizing Agency (BPJS Kesehatan), a public legal entity established to organize health insurance programs as a form of implementation of a universal health insurance system. The presence of BPJS Kesehatan represents the Indonesian government's commitment to promote public welfare and social justice, as mandated by the constitution and aligned with international commitments such as the Sustainable Development Goals, which target universal health coverage by 2030 (Suryanto et al., 2017).

Figure 1.1 Health Budget Ratio of the Indonesian Government, 2014-2022



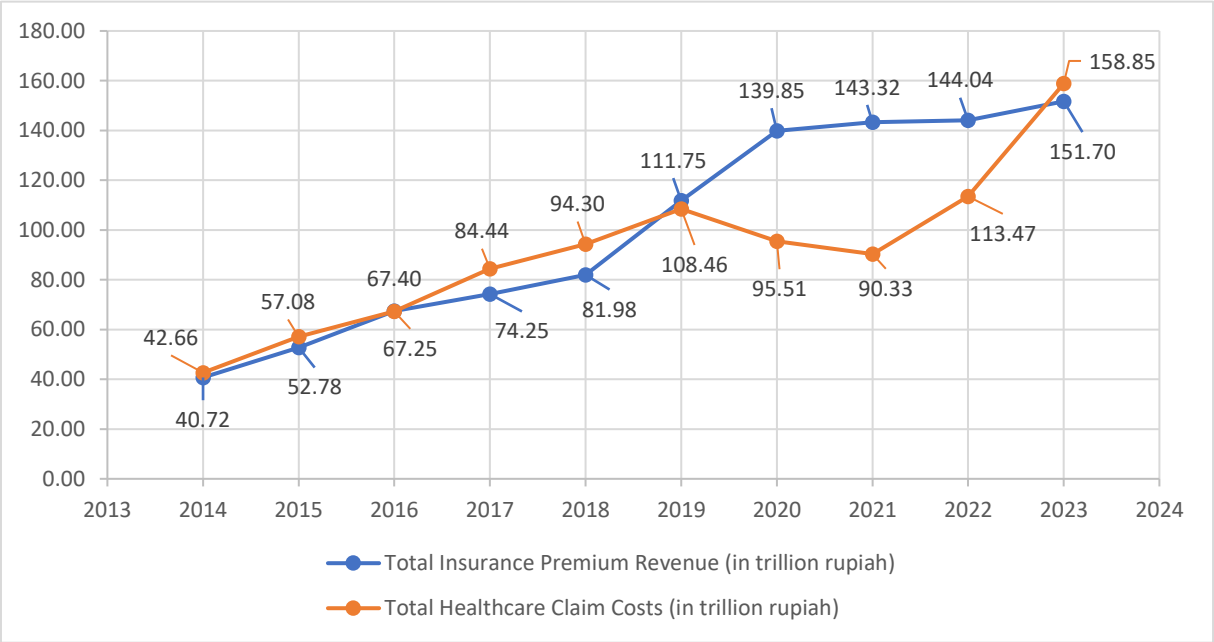
Source: Badan Pusat Statistik, 2024 (processed data by author)

One of the reasons for the increase in the Health Budget Ratio in 2015 and 2016 is the emergence of the Health Budget component through Financing in the form of State Equity Participation to BPJS Kesehatan for the Health Social Security Fund Program amounting to 5 trillion and 6.8 trillion, respectively. The Health Budget Ratio trend tended to be constant in 2016-2019, and again there was a drastic spike in 2020 and 2022 where at that time the world was hit by the COVID-19 pandemic which became a moment of

increasing public and government awareness of health and at the same time public health infrastructure, causing an increase in the health budget ratio in 2022 to reach 9.41%.

Figure 1.2 shows the interesting dynamics of insurance premium income and healthcare claim costs from 2014 to 2023. In the first five years of BPJS Kesehatan's operation, total healthcare claims costs tended to exceed insurance premium income. However, from 2019 to 2023, there was an increase in premium contributions, potentially due to the increase in premium rates in 2020 and 2021 and increased public awareness after the COVID-19 pandemic. Despite this, in 2023, healthcare claim costs again slightly surpassed premium revenues, resulting in a budget deficit. Specifically, insurance premium revenues grew from IDR 40.72 trillion in 2014 to IDR 151.70 trillion in 2023, while healthcare claim costs rose from IDR 42.66 trillion in 2013 to IDR 158.85 trillion in 2023. This growth underscores the expanding role of health insurance in Indonesia's healthcare system and the increasing financial burden of healthcare claims.

Figure 1.2 BPJS Kesehatan Balance Sheet



Source: BPJS Kesehatan Financial Report 2014-2023, 2024 (processed data by author)

Financing remains a significant challenge for public health insurance in developing countries. A model of public health insurance is one in which healthcare plans for citizens are funded by the national or local governments (Masereka et al., 2024). In a study by Qehaja et al. (2023),), An investigation was conducted into the various impacts of government spending on health and several other factors including health insurance, life expectancy, average age and mortality rates, and on economic growth in the Balkan

countries. The findings demonstrate a robust positive correlation (r = 0.637) between health insurance coverage and per capita income, reaching the 1% significance level. This correlation indicates that health insurance has a notable impact on per capita income. Countries with health insurance have an average per capita income that is USD 1,330.93 higher than those without health insurance.

The recent controversial decision by the Indonesian parliament and government to remove the previously set minimum health expenditure of 5% of the APBN and 10% of the APBD, raises significant concerns for the healthcare landscape in Indonesia. The removal of this mandatory spending impacts the healthcare industry and economic productivity. The legislative change was an amendment to the 2009 Health Law, based on Health Minister Budi Sadikin's assertion that there is no direct correlation between health budget allocations and improvements in public health status. The minister made the argument by reflecting on international comparisons, such as the United States where it was noted that despite high per capita health spending, life expectancy in the United States is no higher than countries such as Japan, South Korea, Singapore and Cuba. However, this perspective is arguably overly simplistic and ignores the many factors that influence life expectancy (Saktiawati & Probandari, 2023). Critics argue that reducing mandated health investments can obscure more systemic health problems and potentially lower a country's health standards, impacting everything from life expectancy to economic productivity. This problem sets the stage for the importance of looking at the broader implications of health spending on Indonesia's economic health.

Most previous research has focused on current health expenditure, both public and private, with few studies specifically examining public health insurance. For instance, Qehaja et al. (2023) used a dummy variable for health insurance to distinguish between countries that provide health insurance and those that do not. Vyas et al. (2023) tested 15 Asian developing nations using the ARDL bound test and Granger causality, finding that in both the short and long run, health expenditure depends on GDP. Jagrič et al. (2021) provides an assessment of the significance of the impact of the health sector on the economy in 19 European countries, so that it can be found that the health sector has an important role related to the level of development carried out by a country with a clearer impact in several countries that have a GDP per capita value that tends to be low.

On the health-led growth hypothesis, Muskin makes a suggestion that health spending has an important role to play in providing a stimulus for economic growth. The hypothesis states that health may be considered a form of capital, akin to financial or

physical capital, and that investing in health has the potential to increase income, thereby contributing to economic growth. The relationship between health and economic growth is mediated by its impact on the accumulation of human and physical capital (Bedir, 2016). In his seminal study from 1962, Mushkin examined the relationship between health expenditure and economic growth. He posited that investment in health can stimulate economic performance through increased productivity and human capital. This research established the foundation for subsequent studies on the relationship between health and economic growth. Subsequently, this field of research was developed and expanded by various scholars in the context of endogenous growth theory. This theory underscores the significance of health as a crucial element of human capital for economic advancement (Atilgan et al., 2024).

In the 1980s, Romer developed an endogenous growth model that asserted an educated, healthy, and skilled workforce would exhibit greater efficiency and be better able to utilize technology. Concurrently, investments in health result in enhanced labor productivity, consequently leading to a notable increase in individual income and well-being (Esen & Keçili, 2022). The endogenous growth theory and the health-driven growth hypothesis are interrelated, both emphasizing that the accumulation and investment of human capital is a critical factor in driving economic growth. As a consequence of this theoretical shift, health is incorporated as a crucial element of human capital, thereby enhancing the comprehension of the health-led growth hypothesis. Government expenditure on health and economic growth is positively correlated; investment in health can lead to an augmented supply of health incentives, which can assist human capital and enhance productivity and economic performance (Qehaja et al., 2023).

Based on these dynamics, the purpose of this study is to examine the impact of public health insurance claim costs and government health expenditure on economic growth in Indonesia. Urban population and consumer price index are used as control variables. The purpose of this study is to explain the relationship between these variables and their implications for economic growth in Indonesia in 2014-2023 using the Autoregressive Distributed Lag (ARDL) model.

1.2 Problem Statement

Developing countries are still grappling with the challenge of sustainable financing in their public health insurance systems, including Indonesia. Increased investment in healthcare expenditure by the government has not ensured the long-term financial viability of Indonesia's social health insurance system (BPJS Kesehatan). As evidenced by the data,

the high cost of healthcare claims often exceeds the premiums collected, resulting in budget deficits and financial stress on the system.

Previous research has shown that spending on healthcare can be an investment that improves productivity and human capital, which has a positive impact on economic growth. However, in the context of Indonesia, which has specific demographic and economic challenges, further research is needed to confirm this including health spending in the form of public health insurance claim costs.

Urban population growth and the consumer price index add complexity to the interaction between health expenditure and economic growth. The process of urbanization can drive economic growth, but it can also increase the demand for health services and infrastructure. In addition, inflationary pressures can affect overall economic stability.

1.3 Research Question

This study examines the nexus between health expenditure and economic growth in Indonesia, with a particular focus on the role of public health insurance claim costs, government health expenditure, urban population growth, and the consumer price index. The primary research questions are as follows:

1.2.1 How does the public health insurance claim costs affect Indonesia's economic growth?

1.2.2 How does government health expenditure affect economic growth in Indonesia?

1.2.3 What is the impact of urban population growth and consumer price index on economic growth?

By answering these questions, this study aims to clarify the specific contributions and challenges associated with healthcare investment and spending, and provide a comprehensive understanding of the implications for economic policy and sustainable development in Indonesia.

1.4 Research Objective

The main objective of this study is to assess the impact of health-related spending on Indonesia's economic growth from 2014 to 2023. Specifically, this study aims to achieve the following objectives:

1. To analyze the impact of public health insurance claim costs on Indonesia's economic growth.

2. To determine the effect of government health expenditure on Indonesia's economic growth.
3. To determine the impact of urban population growth and consumer price index on Indonesia's economic growth.

By achieving these objectives, this study attempts to provide a comprehensive analysis of the varied relationships between healthcare expenditure, demographic factors, consumer price index, and economic growth in Indonesia. The findings are expected to provide valuable policy recommendations to optimize healthcare investment.

1.5 Research Hypothesis

In consideration of the existing theoretical framework and empirical evidence, this study presents the following hypotheses regarding the relationship between health spending, demographic change, consumer price index, and economic growth in Indonesia:

- H1: Public health insurance claim costs have a positive effect on Indonesia's economic growth.

  It is hypothesized that spending associated with BPJS Kesehatan, by providing widespread access to health services, improves human capital and productivity, thereby contributing to economic growth.
- H2: Government spending on health has a positive effect on economic growth in Indonesia.

  Increased government spending on health is expected to improve public health infrastructure and services, leading to better health outcomes, higher productivity, and ultimately, economic growth.
- H3: Urban population growth and consumer price index have a significant impact on economic growth in Indonesia.

  This hypothesis states that urbanization and inflation trends play an important role in shaping economic outcomes. Urban population growth is expected to drive economic activity and growth, while changes in the consumer price index may reflect broader economic stability or instability.

These hypotheses will be tested using an Autoregressive Distributed Lag (ARDL) model to examine the short- and long-run dynamics between these variables and their collective impact on Indonesia's economic growth from 2014 to 2023. The positive

relationship hypothesized here is in line with the broader theoretical understanding that investment in health promotes economic progress.

1.6 Scope & Limitation

This research focuses on assessing the impact of healthcare-related spending on Indonesia's economic growth from 2014 to 2023. Geographically, the study is limited to Indonesia, providing specific insights into the economic and health context in Indonesia. In terms of temporal, the study covers the period from 2014 to 2023, capturing relevant economic and demographic trends during the implementation and maturation of the BPJS Kesehatan program. The variables analyzed include public health insurance claim costs, government health expenditure, urban population growth, consumer price index, and economic growth measured as GDP per capita.

However, this study has some limitations. Data availability and quality are significant challenges; the analysis relies on accurate and consistent data from various sources, such as the World Bank, Badan Pusat Statistik (BPS), and BPJS financial reports. Incomplete or inconsistent data may affect the robustness of the findings. Establishing causal versus correlation relationships is inherently complex; while ARDL models can provide insight into the relationships between variables, definitive causal relationships require more in-depth investigation. This study does not consider all potential external factors that could influence economic growth, such as global economic conditions, political stability, and natural disasters, which could complicate the observed relationships. Moreover, the findings specific to Indonesia may not be directly applicable to other countries with disparate health systems, economic structures, and demographic profiles, thereby limiting the generalizability of the results. Lastly, while the ARDL model offers a number of advantages, it is not without limitations. These include assumptions about the linearity and stationarity of the data, which may not hold in all cases. This could potentially affect the accuracy of the results.

In light of these limitations, this study strives to present a comprehensive and transparent analysis, offering valuable insights while acknowledging the inherent constraints of the research design.

1.7 Significance of the Study

The study offers valuable insights and practical recommendations for academics and researchers, governments, and various stakeholders.

1. For Academics and Researchers:

   This study offers a more comprehensive and nuanced understanding of the relationship between health expenditure and economic growth, particularly in developing countries such as Indonesia. By focusing on public health insurance claim costs and incorporating the urban population and consumer price index, the empirical evidence from the study can serve as a reference for future research, facilitating further exploration and validation of the intricate dynamics between health investment and economic development.

2. For the Government:

   This study contributes to the government's understanding of the impact of public health insurance claim costs and government health expenditure on economic growth. The government, in its capacity as a policymaker, is thus equipped with the requisite information to make well-informed decisions aimed at optimizing resource allocation and enhancing the sustainability of the BPJS Kesehatan program.

3. For Public and Private Stakeholders:

   The findings of this study can inform the strategic decision-making processes of stakeholders seeking to enhance the efficiency, risk management, and overall performance of the healthcare system. An understanding of the economic implications of healthcare expenditure and insurance claim costs is crucial for this purpose. Furthermore, the findings of this study highlight the significance of sustainable health financing and the advantages of a health insurance system, thus fostering public awareness and engagement.

1.8 Proposal Thesis Outline

This thesis consists of five chapters, each detailing different aspects of this research.

Chapter 1: Introduction

This chapter outlines the background to the issue of the importance of paying attention to health spending in order to promote economic growth along with its theoretical underpinnings. This is followed by a statement of the problem at hand and the research questions to be answered. The research objectives and hypotheses guide the discussion in this study, followed by the scope and limitations, the significance of the research, and a systematic outline of the thesis.

Chapter 2: Literature Review

This chapter consists of three parts, namely the theoretical basis, previous research relevant to the issues discussed, and the current situation of related variables. At the end of this chapter, the literature gap that the author wants to fill is presented.

Chapter 3: Research Methodology

This chapter explores the methodology used in this research. Starting from the research approach, the empirical model accompanied by the conceptual framework and the ARDL Model function used. This is followed by the operational definition of each variable, object and subject of study. This chapter is closed with a description of data processing and analysis techniques.

Chapter 4: Research Findings and Discussion

This chapter presents the results of the study, starting with an overview of the object of research, and the results of data processing. Followed by interpretation and discussion of the relationship of each variable to economic growth, and closed with policy implications.

Chapter 5: Conclusions and Recommendations

The last chapter concludes this study and consists of three parts; summary, limitations, and suggestions.

CHAPTER 2
LITERATURE REVIEW

2.1 Theoretical Studies

2.1.1 Economic Growth Theory and the Role of Health

There have been significant evolutions in economic growth theory since its inception, with various views attempting to explain the factors that drive long-run economic growth. The Roy Harrod (1939) and Evsey Domar (1946, 1947) models have slight differences but reach the same conclusion that economic growth is determined by high savings and investment. If savings and investment are low, the economic growth of the country's society will also be low. This concept incorporates investment or capital into a country's economic growth. Investment has two roles in terms of aggregate demand (AD) and aggregate supply (AS) that can boost the economy, namely by creating income and in the long run increasing production capacity.

One of the theories that became the foundation of subsequent economic growth theory was the emergence of the neoclassical view developed by Solow and Swan in the 1950s. This model explains that economic growth is influenced by the growth of factors of production (population, labor, and capital accumulation) and the level of technological progress. They emphasized the role of labor and capital in determining economic output, and considered technological progress as an exogenous factor, meaning that it is driven by external events and not by internal economic processes. The two main exogenous factors in the model are population growth and technological process. Some of the assumptions used in this model are constant returns to scale which means that doubling labor and capital will double output, as well as the diminishing returns assumption that as individual factors such as labor and capital increase, output will decrease and lead to a lower marginal product. As an extension of neoclassical theory, exogenous growth emphasizes the role of technological progress as the main driver of long-term economic growth. Although this model made an important contribution to the early understanding of economic growth, it was criticized for not being able to adequately explain the long-run economic growth process. The model assumed that the level of technology is an exogenous factor that is not influenced by

economic decisions within the system, so it cannot explain changes in growth rates in the long run.

In response to the limitations of the neoclassical approach, economists such as Romer and Lucas developed endogenous growth theory in the 1980s. Endogenous growth theory attempted to incorporate endogenous technological processes so as to obtain better firm or industry output results. Endogenous growth theory itself assumed that the growth process originates at the firm or industry level. Thus, The capital owned by each person and the capital in conducting Research and Development (R&D) is an important thing and plays a major role in growing the economy which is carried out in the endogenous growth model. The theory emphasizes that factors affecting economic growth, such as human capital accumulation, innovation, and knowledge, should be understood as an integral part of the economic system itself. Within the framework of endogenous growth theory, the role of human capital-which includes education and health-is central. The theory argues that investment in human capital can trigger productivity gains and, in turn, accelerate economic growth. Mushkin (1962) highlighted that investment in health has the effect of increasing labor productivity, which in turn increases income levels and overall economic welfare. Individuals with superior health and longer life expectancies are more likely to obtain and enhance their human capital skills, thereby contributing to economic growth (Hansen, 2013).

One important development in endogenous growth theory is the concept of Health-Led Growth Hypothesis (HLGH) which has been developed and supported through various studies and academic discussions in the context of endogenous growth theory. This hypothesis stated that investment in health can positively impact economic growth through increased labor productivity. In other words, better health allows the workforce to be more productive, which can then lead to an increase in economic output. Health-Led Growth Hypothesis views health as a form of human capital that when invested in can improve productivity and economic outcomes. It is still related to endogenous growth theory, which emphasizes the importance of human capital accumulation and investment as drivers of economic growth. Health spending is seen as an investment that generates economic returns through improved health outcomes, increased labor productivity, and demographic dividends. However, it is important to note that health investments do not directly affect economic growth, but rather through the intermediary of increased productivity.

To explain how health insurance claim costs and health expenditure affect economic growth, we can use the Cobb-Douglas production function, which is one of the main approaches in economic growth theory. The Cobb-Douglas production function is expressed as:

$$Y = A \times K^{\alpha} \times L^{\beta}$$

Where:

- Y is total output (GDP),

- A is the level of technology or total factor productivity,

- K is capital,

- L is labor,

- α and β are the elasticities of output with respect to capital and labor, respectively.

The rate of economic growth comes from 3 sources, namely capital accumulation, increased labor and technological improvements or total factor productivity. Total factor productivity is the ratio of output that cannot be explained by a number of inputs used in production other than capital and labor, which aims to explain other factors (beyond capital and labor) that affect economic growth. In the context of endogenous growth theory, health expenditure and health insurance claim costs have the potential to affect economic growth through several channels in the Cobb-Douglas production function. Through capital, government health expenditure such as the construction of hospitals and clinics, can increase the stock of physical capital (K) which then increases the production capacity of the economy as a whole, thus allowing an increase in output (Y) through an increase in physical capital. Capital is also able to increase the productivity of capital, where if a healthier and more productive workforce can use capital more efficiently, it can increase the output produced by existing capital. This strengthens the contribution of K to Y and increases the elasticity of output to capital. Meanwhile, through labor (L), Health expenditure can increase labor productivity. A healthier workforce, having fewer sick days, will be more productive. This increase in productivity increases output (Y) either through an increase in labor contribution or indirectly by increasing the effectiveness of capital (K). The endogenous growth model posits that an educated, healthy, and skilled workforce will be more productive and better able to utilize technology. In addition, if through total factor productivity, an

increase in health expenditure can encourage research and development in the health sector that results in new technological innovations. In turn, these innovations will increase total factor productivity (A) which magnifies the effect of Health expenditure on output (Y). Increased economic efficiency can also occur with improved population health, hence the economy as a whole becomes more efficient. This increase in efficiency means that each unit of capital (K) and labor (L) is better utilized resulting in more output (Y) without the need for a proportional increase in capital (K) or labor (L) inputs.

In addition, health insurance claim costs may affect economic performance through the same mechanism. When claims costs increase, this may reflect improved access to healthcare, which in turn improves the health and productivity of the workforce. Not all insurance claim costs are related to disease treatment. Some of these costs are allocated to promotive and preventive services, such as vaccinations, routine health check-ups, and health education. These services aim to prevent diseases before they occur or detect them early, thereby reducing future health burdens and keeping the population productive. Investment in preventive and promotive services through insurance claims contributes to the overall improvement of public health. In the long run, this can lower the number of claims for diseases that are more serious and more expensive to treat, and maintain economic stability with a healthier and more productive population. Although insurance claims increase, if they are used efficiently for effective healthcare, this can be considered an investment in human capital. This effect can also be ambiguous depending on how such costs are managed and the efficiency of the health system itself. If high claims costs are not matched by improvements in healthcare quality, the impact on productivity and economic growth could be minimal.

In a paper written by Maré (2004) under the title "What Do Endogenous Growth Models Contribute?", he observed that factor accumulation and innovation are indispensable for economic growth, and that diminishing returns can hinder long-term growth. The impact of the assumptions inherent in such models is significant on their applicability and validity. The downside of endogenous growth models is that they are dependent on the assumptions made, although they offer valuable insights into the growth mechanism. Maré also highlighted that ideas and knowledge, due to their unique and partially excludable nature, become a significant source of spillover and scale effects. The value of endogenous growth theory lies not only in its unique insights

into growth, but also in its modeling methods. Its modeling methods provide a structured approach that makes it convenient to understand the complex interactions that drive economic growth. As opposed to neoclassical growth models that provide a fundamental understanding of growth driven by external factors, endogenous growth models offer a more comprehensive perspective by incorporating health as an important component of human capital. This integration unlocks the important role of public health expenditure in driving economic growth, particularly through its influence on labor productivity, human capital accumulation, and overall economic resilience.

Modern economic growth theory places health as a key component in the process of human capital accumulation that drives economic growth. Although health investment does not directly increase economic output, it plays an important role in increasing labor productivity, which is the main pathway through which health contributes to economic growth. Thus, health expenditure and health insurance claims costs have the potential to be important drivers of economic growth, especially in the context of improving the quality and accessibility of effective health services.

2.1.2 Economic Theory of Insurance

Economic Theory of Insurance is a subject that integrates economic concepts with insurance principles to understand the behavior of individuals and companies in handling risk. Definition of Insurance is a financial institution that receives premiums from participants and provides financial protection against risks faced by individuals or companies. The existence of insurance aims to transfer risks from individuals or companies to insurance companies, thereby reducing the uncertainty of the economic burden of uncertain losses. Conceptually, insurance transfers risk from individuals or companies to insurance companies, thereby reducing the negative impact of unwanted events. Insurance companies receive premiums that are invested in financial instruments such as bonds and stocks, hence helping economic growth through funding infrastructure projects and companies (Harrison & Ng, 2019). The following are the main components of Demand for Insurance:

1. Risk Avoidance: Individuals are generally risk averse, which means they prefer to avoid uncertainty and will pay premiums to reduce risk. This is a fundamental concept in understanding why people buy insurance.
2. Utility Theory: Expected Utility Theory (EUT) and Rank-Dependent Utility (RDU) provide a psychological path to understanding risk preferences. EUT states that

aversion to variability drives risk preference, while RDU adds an additional psychological path.

From the other sides, there are key components that need to be understood in Supply of Insurance (Rees & Wambach, 2008):

1. Risk Pooling: Insurance companies collect risks to distribute the cost of potential losses among many policyholders, making it easier for each individual to manage.
2. Risk Spreading: This concept is closely related to risk pooling, but emphasizes the distribution of risk across a large number of policies to reduce the likelihood and impact of a single loss.
3. Actuarial Science: The supply side of the insurance market is heavily influenced by actuarial science, which involves assessing the probability of loss and setting the appropriate premium.

Insurance is an essential economic mechanism in risk management and resource distribution in society. From an economic point of view, insurance aims to transfer risk from an individual or entity to an insurance company, which then distributes the risk among many insureds. As such, insurance allows individuals or entities to deal with uncertainty and potential financial losses in a more planned and controlled manner. Insurance plays a key role in economic stability and risk management. In microeconomics, insurance helps individuals and companies avoid the negative impact of unwanted events, such as accidents, illnesses, or natural disasters. By paying premiums regularly, the insured gains protection from potentially unpredictable large losses.

According to economic theory, insurance enables efficiency in resource allocation as individuals can transfer risks to other parties that are better able to manage and distribute them. Insurance companies, with a wide customer base, can spread risk among many insureds, so that the risk does not become a heavy burden for one individual or entity alone.

Two important concepts in insurance economics are adverse selection and moral hazard. Adverse selection occurs when only individuals with high risk choose to buy insurance, while those with low risk tend not to buy insurance. This can cause insurance companies to incur losses as they only receive premiums from individuals who are more likely to make a claim. In contrast, moral hazard occurs when individuals or entities that have been insured tend to take greater risks because they know that they are protected by insurance. Both phenomena can affect the performance and profitability of insurance companies, as well as the stability of the insurance market as a whole. Asymmetric

information, a situation where one party has more or better information than the other party, is often the cause of adverse selection and moral hazard. For example, in health insurance, individuals may have better information about their health conditions than the insurance company, so those who feel they have a high risk are more likely to buy insurance (Rees & Wambach, 2008).

Another concept that needs to be understood is risk and insurance theory, a study that integrates economic concepts, risk management, and insurance principles to understand the behavior of individuals and companies in the face of risk. Risk etymologically means the unpleasant (adverse, harmful) consequences of an act or action that can occur in the future. In terminology, the word risk has many interpretations. Some of the characteristics of risk are the possibility that it could happen in the future, the combination of hazards, the uncertainty of loss, the tendency that the final outcome may differ from the predicted outcome, the possibility of loss, injury, loss, or destruction (Harrison & Ng, 2019).

Insurance is very close to the science of risk management, which is the science of how to systematically identify various kinds of risks that threaten organizations or individuals, and choose the best method to deal with or face the threat of loss due to risks consistent (appropriate) with goals or objects. There are several steps of Risk Management, namely:

- Risk Prevention: Eliminate the source of risk.
- Risk Mitigation: Minimizing the impact of risk.
- Risk Transfer: Moving the risk to another place.
- Risk Acceptance: When the risk cannot be avoided or transferred.

To conduct operations, insurance companies receive premiums from their members, both individuals and companies. There are two principles of premium calculation:

1. Risk Loading: This principle of premium calculation involves estimating expected claims and choosing a fair risk loading. There are several different risks loading principles, including the expected value principle, standard deviation loading, variance loading, and loading according to the constant utility principle.
2. Positive Loadings: Positive loadings in the context of insurance refer to additional costs added to insurance premiums to cover various costs and profits required by insurance companies. Components that include positive loadings are commissions, administrative costs, claim settlement costs, profit margins, and risks taken by insurance companies when guaranteeing a policy (Kahane, 1979).

Insurance is not only important for individual protection, but also has a significant impact on the economy as a whole. Health insurance is often associated with economic performance. A study by Fan et al (2024) stated that health insurance can have a significant positive correlation with economic performance. Health insurance encourages consumption by reducing the economic burden on individuals and increasing the accessibility of health services. Public health insurance, in particular, has been shown to have a greater impact on economic performance compared to commercial health insurance. In addition, health insurance also serves as an important instrument to address poverty caused by disease by improving the health of the population and increasing the labor force. By providing financial protection, insurance encourages healthy investment and risk-taking. Companies can take bolder business decisions, such as expansion or innovation, because they know that their assets and operations are protected by insurance. At the macro level, insurance also helps financial stability by reducing the negative impact of catastrophic events on the economy. Insurance also supports social functions, such as providing a safety net for individuals and families affected by unexpected events. By reducing uncertainty, insurance allows individuals to better plan for their future, which in turn improves social welfare.

2.2 Previous Research

2.2.1 Health Expenditure and Economic Growth

Several previous studies have explored the relationship between health expenditure and economic growth. With the same theoretical basis, they used different methods and data, as well as different research subjects. The results of their studies are not always in line with the theory. Most studies support that greater health spending will help economic growth. However, there is evidence that this relationship may vary.

Bedir (2016) applied a modified Granger causality test to the relationship between GDP per capita and health expenditure per capita in European, Middle Eastern and Asian countries. He found one-way causality between per capita health expenditure and per capita GDP in the Philippines and between per capita GDP and per capita health expenditure in China, Indonesia and South Korea. Different results were found in the case of the Czech Republic and the Russian Federation, where there was a two-way causality between the two. This suggests that there are varying dynamics between health expenditure and economic growth in different countries, as the direction of the causal relationship can be determined by the economic and institutional context in each country.

In line with previous findings, Beylik et al. (2022) focused on health expenditure and economic growth in 21 OECD countries with a 29-year time span from 1990 to 2019. Using the Driscoll-Kraay standard error approach in the context of panel data analysis, they showed a positive relationship between all health expenditure indicators and economic growth. He illustrated that a 1% growth in out-of-pocket health expenditure would result in a 0.04% increase in real GDP. This finding supports the endogenous growth theory, where investment in health will increase economic productivity. Beylik et al. (2022) and Bedir (2016) also illustrate that spending on health is necessary for economic growth.

A similar year-span study by Kamanda et al. (2022) identified the long-term benefits of health spending through an analysis of 45 countries in Sub-Saharan Africa over the period 1990 to 2018. However, the results showed that no short-term causality was observed with the tests applied for Granger causality in health expenditure and health outcomes caused by economic growth in the long run. This result is consistent with the conclusion found by Beylik et al. (2022) when they showed that health investments that provide economic benefits have a lead time, especially in developing regions.

Contrary to the conclusions of previous studies, Jagric et al. (2021) estimated multipliers for healthcare spending in 19 European countries. A favorable impact on national economies was found through increased spending on health products and services. Countries with lower levels of GDP per capita are more affected. The results suggest that there is a relationship between the health sector and the country's level of development, which is more beneficial in countries with lower levels of gross domestic product (GDP) per capita. The illustration underlying the argument is that with the same change in the health sector, the effect on employment in the national economy is greater in countries with lower GDP per capita than in more developed countries. Kamanda et al. (2022), on the other hand, argue that infrastructure and institutions are the main reasons why the impact of health spending has a faster and more pronounced effect on economic growth in developed countries than in developing countries.

More complex research was conducted by Sethi et al. (2020) by adding institutional quality, domestic and foreign investment as controlling variables. They used several analytical techniques such as Ordinary Least Square, Random Effect Method, Johansen-Fisher cointegration, and Granger causality test. In the short run, there is a bidirectional relationship between health expenditure and economic growth in South Asian countries from 1996 to 2018. This study both confirmed and extended the findings of Jagric et al.

(2021) by showing a mutual relationship between health spending and economic growth, which can be particularly significant in regions with developed health systems.

Using Generalized method of moments (GMM) on 51 countries, Chaabouni and Saidi (2017) also previously revealed that there is a bidirectional causality relationship between health expenditure and economic growth. This finding offers insights with a broader global perspective on the bidirectional causality relationship while supporting the importance of countries investing in health for economic development, which is in line with the findings of regional studies by Sethi et al. (2020) and Jagric et al. (2021). Slightly different from previous studies, Zaidi and Saidi (2018) investigated 26 Sub-Saharan African countries using PMG and ARDL models. They found that there is a unidirectional and positive impact of health spending on economic growth. This finding provides insight into the direct role of health investment in driving economic growth, especially in less developed regions where other factors may not have a causal relationship.

GMM as well as panel Granger causality tests were also conducted by Halici-Tullice et al. (2016) to provide further insights. They distinguished public health expenditure from private health expenditure, and tested their relationship to economic growth in 25 high-income and 19 low-income countries. The different types of spending, in this study, yielded different results, with public health spending having a significantly positive impact on economic growth, while private health spending had a negative impact. This finding also provides room for in-depth exploration of the different types of health expenditure that have the possibility of different impacts on economic growth. This difference can be interpreted that public health investment has more potential to boost economic growth than private health spending, especially in low-income countries.

In a distinctive approach, Qehaja et al. (2023) included public health insurance as a dummy variable in their study of Western Balkan countries. The findings indicate that government expenditure on health has a positive and significant impact on economic growth, with a significant positive correlation between health insurance coverage and income per capita. This study underscores the pivotal role of health insurance in enhancing economic performance, a factor that is not widely addressed in other studies. It offers a distinctive perspective on the interplay between health spending and economic growth. Some studies focus on a single country (Table 2.1), thereby providing valuable insights at the local level. Yasikah et al (2023) discovered a positive correlation between GDP in Indonesia and health spending. Matahir et al. (2023) identified a long-run cointegrating causality relationship between economic growth and health expenditure in Malaysia.

Similarly, Esen and Keçili (2022) observed long-run cointegration among variables and unidirectional causality between health expenditure and economic growth in Turkey. In Pakistan, Wang et al. (2019) discovered a bidirectional Granger causality between health expenditure and economic growth. Conversely, Akingba et al. (2018) observed that health capital, as measured by health expenditure per capita, had a positive and significant effect on Singapore's economic growth in the long run, with unidirectional causality from health expenditure to GDP per capita.

Table 2.1 Single Country Previous Studies

No	Research	Variables	Dataset	Methodology	Research Object
1	Yasikah et al, 2023	Current Health Expenditure, CO2 Emissions, and GDP	2000 - 2019	VECM	Indonesia
2	Matahir et al, 2023	Real GDP, Health expenditure, Energy intensity, Energy demand	1980 - 2016	ARDL Cointegration analysis & Causality approach by the VECM	Malaysia
3	Esen & Keçili, 2022	Y: GDP per Capita X: health expenditure per capita, household consumption, life expectancy at birth, trade, and foreign direct investments were added as control variables	1975–2018	Johansen Cointegration & Granger Causality	Turkey
4	Wang et al, 2019	Current expenditures on health per capita, CO2, Per capita GDP	1995 - 2017	ARDL and VECM Granger Causality	Pakistan
5	Akingba et al, 2018	Y: GDP per capita X: Investment, Health expenditure per capita, education per capita and trade openness	1980 - 2013	(ARDL)-ECM methodology	Singapore

Source: Author, 2024

The reviewed studies collectively support the hypothesis that health spending has a positive impact on economic growth, particularly in developing and emerging economies. The consistent findings across different methodologies and geographical areas are in

alignment with the theoretical framework of this study, which underscores the significance of public health insurance and government health spending in enhancing economic performance in Indonesia. These studies provide substantial evidence in support of the health-led growth hypothesis, which posits that investments in health are pivotal to enhancing productivity, human capital, and economic resilience. Identified research gaps include the necessity for more localized studies focusing on specific periods and contexts, such as healthcare reform in Indonesia from 2014 to 2023, and the incorporation of additional control variables to facilitate a comprehensive analysis.

2.2.2 Urban Population, Consumer Price Index and Economic Growth

The relationship between urban population and economic growth has been the subject of extensive study. The relationship between urbanization and economic development is widely recognized; indeed, the majority of economic output is generated in urban areas (Rahman, 2019). As urban populations grow and contemporary businesses expand, economic growth accelerates, creating a vicious cycle where urbanization propels economic prosperity (Chen et al., 2014). Studies have indicated that there is a statistically significant interaction among population growth, economic development, and urban expansion. This interaction has short-term consequences, with population increase and economic development driving urban expansion (Zhang & Xie, 2019).

As evidenced by empirical research, the process of urbanization in China is primarily driven by economic growth. However, there is a critical threshold at which the expansion of urban areas exerts a significant negative impact on economic growth (Zi, 2017). The increase in the urban population in China has been demonstrated to have a positive effect on economic growth rates, thus underscoring the significance of urbanization as a principal driver of economic development (Yuan, 2018). Moreover, the relationship between population urbanization and economic growth has been analyzed using the Granger causality test, which indicates the existence of a unidirectional causality relationship between the two factors (Hong, 2016). his illustrates that while economic growth may drive urbanization, the reverse is also true, indicating a complex and interrelated relationship.

The influence of urban population growth on economic agglomeration has been a key focus, with urban economic agglomeration dependent on population growth, creating a symbiotic relationship between the two (Fan et al., 2019). Numerous studies have investigated the impact of urbanization and population policies on China's economy, underscoring the significance of these factors in propelling economic growth (Feng, 2023).

The growth of the urban economy is becoming increasingly linked to the service sector, indicating a shift in economic contribution towards services with higher labor productivity (Narayana, 2010). This transition to a service-oriented economy in urban areas highlights the importance of urbanization in increasing economic output through more productive sectors.

While urbanization is often linked to economic growth, numerous studies have underscored the potential challenges associated with this process. For example, an increasing proportion of the urban population has been demonstrated to have a deleterious impact on economic growth in certain contexts, indicating a correlation between urban population dynamics and economic prosperity (Mahalik & Mallick, 2014). As rapid urbanization has been associated with environmental challenges, including increased pollution, sustainable urban development strategies are urgently needed (Zhao, 2023). The impact of urbanization needs to be carefully managed to reduce the negative externalities such as environmental degradation and social inequality.

This research was conducted using the Consumer Price Index (CPI), this index is applied as part of the second control variable, so that this index functions as a medium for measuring price changes in goods and services that have occurred, over time. The relationship between the Consumer Price Index (CPI) and economic growth is also worthy of further research. It plays an important role in influencing economic activity by impacting income, salary and pension levels (Suciu, 2023). A number of studies have divided their findings into two regarding the impact of the CPI on economic growth, there is the long-run impact as well as the short-run impact. An empirical finding has proven that shocks to the CPI can produce a differential impact on economic growth (Trejo-García, 2024). Differential short-run and long-run correlations have been investigated between CPI and economic growth, which although there may be a direct impact, CPI may not exert a long-run causal effect on GDP (Abdullahi, 2023). Therefore, it can be illustrated that if in the short term, CPI fluctuations can have an impact on economic growth, due to the absence of causality effects, it takes longer, or in the long run the effect of CPI fluctuations can be reduced.

The CPI is often a benchmark for key economic indicators and is considered to provide information about the state and progress of a country because it can reflect changes in the price level of goods and services (Olufunmike et al., 2019). In the short term, CPI has been shown to cause economic growth, indicating that the relationship is significant and CPI can be used as a macroeconomic determinant (Atiq et al., 2020) This finding

supports the idea that inflation can affect economic growth by influencing purchasing power and consumption patterns, as captured by the CPI. Negative effects can be brought about by inflation or the CPI. Several previous studies in various countries suggest that rising prices of goods and services, as reflected in the CPI, can have a negative impact on GDP growth (Subedi, 2022). Inflation and CPI have the potential to adversely affect economic stability and growth. The relationship between CPI and economic growth is complex and influenced by various factors. The relationship between CPI and economic growth is complex and influenced by various factors. There is a study that compares the CPI when it is volatile as well as when it experiences moderate increases. The results of the study stated that unstable CPI conditions can worsen economic development. Conversely, a moderate increase in the general price level of the CPI can enhance economic growth in certain contexts (Ayonete, 2023). Through this research, it can be seen that the CPI effect has a dual nature, if inflation is controlled it supports growth, but if volatility is high, it can undermine economic stability.

Urban population dynamics and the Consumer Price Index significantly affect economic growth. While urbanization generally promotes economic growth through increased productivity and economic agglomeration, it also presents challenges that require careful management. Similarly, the CPI affects economic growth through its impact on inflation and purchasing power, highlighting the need for stable price levels to support sustainable economic development. The use of urban population and the Consumer Price Index are valid control variables in studies that analyze the impact of public health insurance claim costs on economic growth. With their dynamics against economic growth, they help isolate the impact of health insurance costs on economic growth, leading to more accurate and meaningful conclusions.

2.2.3 Research Gap

Despite the large number of studies examining the relationship between health expenditure and economic growth, there are still some important gaps that this study seeks to address, especially in the Indonesian context. These research gaps highlight the need for a deeper understanding of how public health insurance and government health spending affect economic performance, especially considering the unique economic and health dynamics in Indonesia from 2014 to 2023.

First, there have been many previous studies exploring the relationship between health expenditure both globally and regionally, but in this decade only a few studies have focused on Indonesia as a research subject, while each country may have different characteristics. Previous studies were conducted by Yasikah et al. (2023) with Indonesia as the research subject and Sethi et al. (2020) with South Asian Countries as the research subject. Although both agree that health spending is important for economic growth, there are still few studies that specifically analyze policies in Indonesia in an economic context. Given Indonesia's unique socio-economic characteristics and the occurrence of several health-related momentum in the past decade, such as the establishment of BPJS Kesehatan and the increase in health spending, this gap is significant and requires specific analysis in an economic context.

Secondly, most previous studies discuss health expenditure in macro terms, either using per capita or current health expenditure. Halici-Tullice et al. (2016) distinguish between private and public health expenditure which have different impacts on economic growth. However, there is limited research that investigates in depth how public health insurance schemes specifically affect economic outcomes. This study provides a focused and detailed analysis of the role of public health insurance and government health spending on economic growth in Indonesia.

Third, only some studies use CPI or urban population as control variables (such as (Esen & Keçili, 2022)), This study integrates both into the interaction of health spending and economic growth. Considering the character of rapid urbanization and variable inflation rates in Indonesia, integrating both can significantly affect economic performance.

Fourth, some previous studies used simple econometric models, such as OLS, FEM, REM. This study uses an ARDL analysis approach to capture short-term and long-term dynamics accurately and in-depth. To address this research gap, a focused and context-appropriate analysis of Indonesia is needed, combining a detailed examination of the public health insurance scheme and sophisticated econometric techniques.

This study aims to fill these research gaps by analyzing more specifically the role of health expenditure and public health insurance on economic growth in Indonesia over the last decade, from 2014-2023, so as to make a valuable contribution to the literature and for policy makers to consider.

2.3 Description of the Variables Used

2.3.1 Current Condition of Health Expenditure in Indonesia

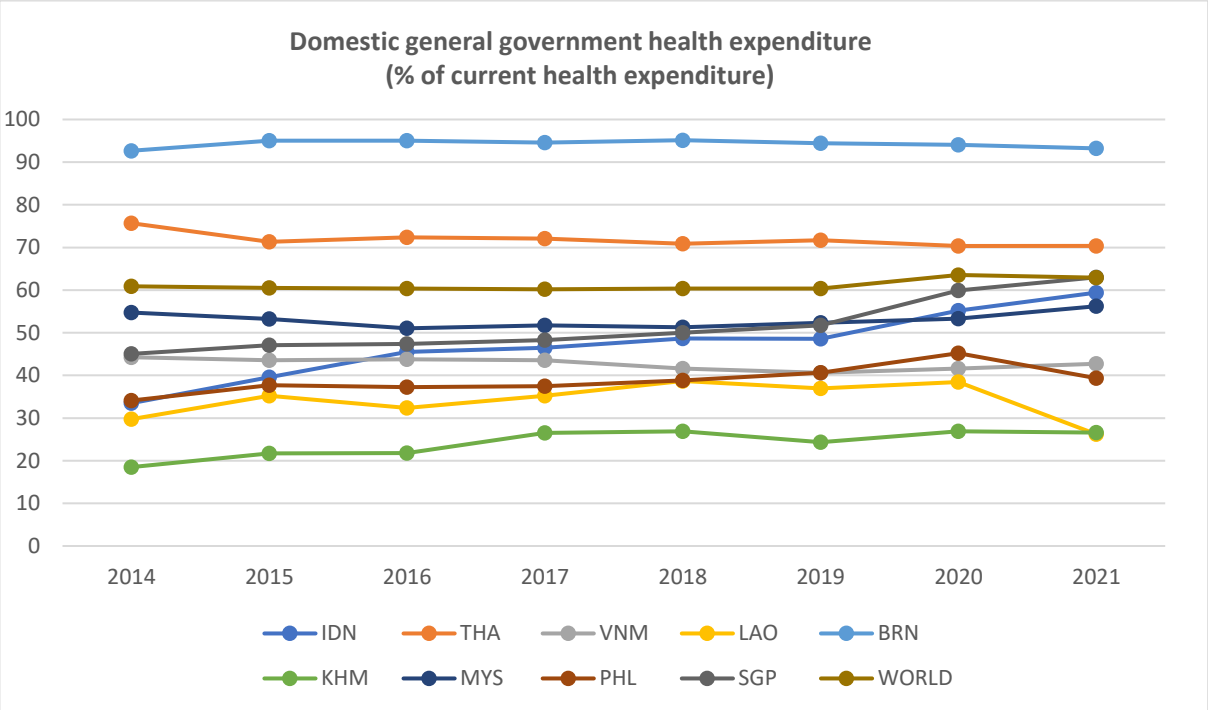
Health expenditure in Indonesia has undergone significant changes over the past decade, as evidenced by data from the World Bank and the Indonesian Ministry of Health that shows domestic government health expenditure as a percentage of total government expenditure has shown a significant upward trend. The budget structure of health spending in Indonesia is categorized into three main components: central government spending, transfers to local and village governments, and financing through state-owned enterprises such as BPJS Kesehatan:

1. Central Government Expenditure: Central government spending includes allocations to various ministries and agencies such as the Ministry of Health, the National Agency of Drug and Food Control (BPOM), the National Population and Family Planning Agency (BKKBN), and other state agencies. The Ministry of Health's budget, for example, increases from IDR 22,428.34 billion in 2010 to IDR 96,855.6 billion in 2022, highlighting significant investments in health services and infrastructure. Similarly, the BPOM budget increases from IDR603.53 billion in 2010 to IDR2,244 billion in 2022. These investments reflect the central government's efforts to improve public health infrastructure and services.
2. Transfers to Local and Village Governments: This component includes funds transferred to local and village governments, which include special allocations for health and family planning (DAK), health operational assistance (BOK), and other special funds. In 2022, total transfers for health purposes reached IDR 66,930.6 billion, underscoring the decentralized approach to improving health services across Indonesia. DAK for health, for example, has increased from Rp3,134.5 billion in 2010 to Rp15,774.3 billion in 2022, facilitating the improvement of health infrastructure and services in the regions.
3. Financing through State-Owned Enterprises: This includes capital injections into BPJS Kesehatan, which aims to support the public health insurance program. To date, it has only been recorded twice under the account name 'State Equity Participation to BPJS Kesehatan for the Health Social Security Fund Program', in 2015 and 2016, allocating IDR 5,000 billion and 6827.9 billion for this purpose. BPJS Kesehatan plays an important role in reducing the financial burden of healthcare on individuals and families, thereby improving access to necessary medical services.

The overall health budget, which includes both central and local spending, reflects a strong increase year-on-year. In 2010, total health expenditure was IDR 29,893.5 billion,

which increased to IDR 255,393.7 billion by 2022. This substantial growth underscores the government's continued efforts to improve healthcare provision across the country.

Figure 2.1 Domestic General Government Health Expenditure (% of current health expenditure)



Source: World Development Indicator, 2024 (processed data by author)

Analyzing Indonesia's health expenditure as a percentage of the total government budget shows a steady increase. From 2014 to 2021, Indonesia's government health spending as a percentage of total health spending ranged from 40-50%, in line with neighboring countries such as Malaysia and Thailand, but still lagging behind countries such as Brunei which consistently exceeded 90%. This comparison highlights the progress and challenges in Indonesia's health financing strategy.

The data shows that Indonesia has made considerable strides in increasing its health spending, which is critical to improving health outcomes and economic productivity. However, Indonesia still faces challenges in achieving optimal health spending levels

compared to some countries in the region. Continued investment in health, coupled with efficient resource allocation and utilization, remains critical to maintaining the positive trend in health outcomes and economic growth.

2.3.2 Public Health Insurance in Indonesia (BPJS Kesehatan)

A public health insurance (PHI) system is a model of health insurance in which the funding of healthcare plans for citizens is the responsibility of governments at the national or local levels. The introduction and expansion of PHI has been a pivotal factor in achieving universal health coverage (UHC) and guaranteeing equity and quality in healthcare across numerous countries. PHI schemes guarantee that all individuals have access to essential health services without financial constraints. (Masereka et al., 2024). In contrast to developed countries, such as Canada, Germany, Japan, and Singapore, which provide universal health coverage financed primarily through taxes, some developing countries have implemented voluntary or mandatory PHI schemes. In the Philippines, Indonesia, Laos, and Vietnam, for example, individuals are obliged to pay premiums for public health insurance.

Universal Health Coverage (UHC) represents a novel international standard, which the United Nations (UN) and the World Health Organization (WHO) are endeavoring to disseminate globally. Universal Health Coverage (UHC) is a health insurance system that ensures that every citizen has equitable and adequate access to health services without encountering significant financial barriers. Furthermore, UHC provides financial risk protection for citizens utilizing health services, thereby preventing financial losses. The Government of Indonesia has fully embraced the UHC norm and has entered the third and final phase of the norm internalization process with the appointed local actor, BPJS Kesehatan (Saputro & Fathiyah, 2022). In Indonesia, the Social Security Administration Agency for Health—also known as BPJS Kesehatan—is the designated public legal entity with the responsibility of administering the country's national health insurance program. This mandate is legally enshrined and the agency is ultimately answerable to the President. The headquarters of BPJS Kesehatan is situated within the capital city of Indonesia. Additionally, the organization maintains a network of regional offices distributed across the country's provinces, along with a presence in districts and cities, represented by branch offices.

The primary function of BPJS Kesehatan is the administration of the National Health Insurance (JKN) program that covers all Indonesian citizens, with the aim of providing equitable and quality access to health services. This program began with the

transfer of previous health insurance membership into JKN, so that all Indonesian citizens can be covered by comprehensive health insurance.

The existence of BPJS is absolute as an implementation of Law No. 40/2004 on the National Social Security System (SJSN). Explicitly, the SJSN Law states that 4 state-owned companies in the insurance sector, namely PT Jamsostek (Persero), PT Taspen (Persero), PT Asabri (Persero), and PT Askes (Persero) will be transformed into BPJS. Then the government officially established the National Social Security Board (DJSN) through Presidential Decree (Keppres) Number 110 of 2008 concerning the appointment of DJSN members dated September 24, 2008. DJSN functions as the formulator of general policy and synchronization of the implementation of the National Social Security System (*Sejarah DJSN*, 2021). When the BPJS Law came into effect, the Board of Commissioners and Directors of PT Askes (Persero) and PT Jamsostek (Persero) were tasked by the BPJS Law to prepare various things needed for the transformation process or change from Persero to BPJS with the status of a public legal entity. These changes include structures, work mechanisms and also institutional culture. Meanwhile, according to the BPJS Law, BPJS Kesehatan (the transformation of PT Askes) must start operating on January 1, 2014, while BPJS Ketenagakerjaan, which organizes four other social security programs, namely Work Accident Insurance, Old Age Insurance, Pension Insurance and Death Insurance, will start operating no later than July 1, 2015. In its preparation, PT Askes did not work alone, because since the SJSN Law in 2004 and reaffirmed in the BPJS Law in 2011, Ministries/Institutions and Local Governments have coordinated earnestly to deliver PT Askes into BPJS Kesehatan (Finaka, 2019). Through the National Health Insurance (JKN) and Healthy Indonesia Card (KIS) programs organized by BPJS Kesehatan, The presence of the state as the highest leader provides guarantees to all Indonesian citizens in the community to be protected by getting overall health insurance with full justice and equality. BPJS Kesehatan plays an important role in implementing UHC in Indonesia through the JKN program, while government health spending is focused on improving the quality and accessibility of health services for all citizens.

The financial structure of BPJS Kesehatan is comprised of two distinct categories: BPJS assets and Social Security Fund assets. In the event of a lack of liquidity, BPJS Kesehatan has the authority to provide temporary funding to the Social Security Health Fund up to a maximum of 25% of BPJS Kesehatan's assets as recorded in the previous month's financial statements. This provision aims to guarantee the continuity and stability

of the health insurance program while maintaining equilibrium between liabilities, assets, and equity ratios. BPJS Kesehatan's assets are sourced from:

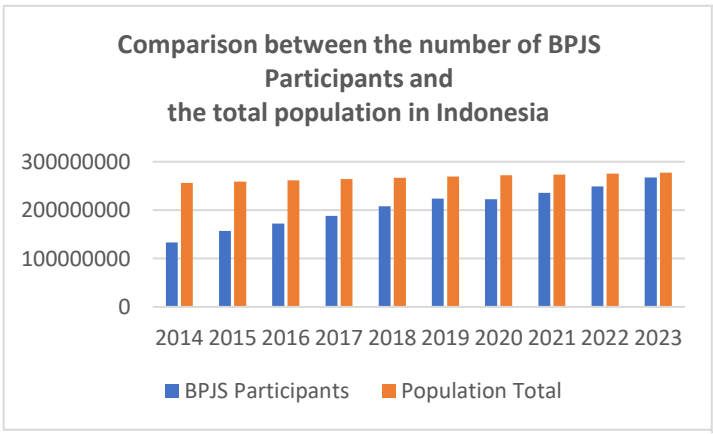
1. Initial capital from the government, which constitutes state assets that are separated and not divided into shares.
2. Transfer of assets from state-owned enterprises that previously administered social security programs.
3. Development of BPJS assets.
4. Operational funds derived from the Social Security Fund.
5. Other legitimate sources as per applicable regulations.

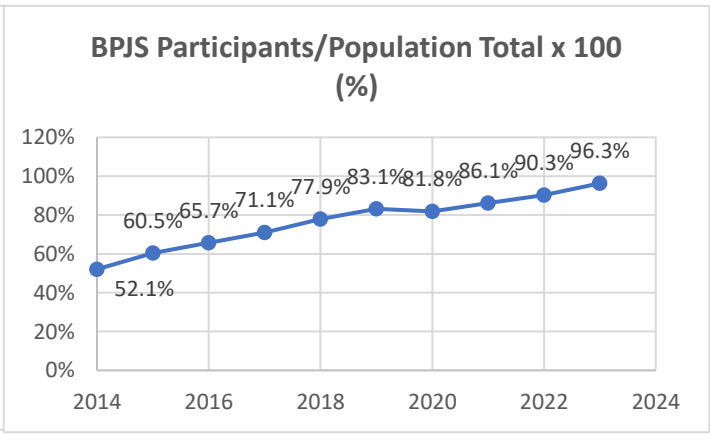
And the assets of the Social Security Fund are sourced from:

1. Social security contributions.
2. Development of the Social Security Fund.
3. Transfer of assets from social security programs that participants are entitled to from state-owned enterprises managing social security programs.
4. Other legitimate sources as per applicable regulations.

The term "social security contributions" encompasses both social security assistance contributions and premium assistance. The contributions are sourced from two categories of participants: those who pay independently or those who are remunerated by their employers. These contributions are categorized into three groups. The first group comprises employers who pay the contributions directly. The second group consists of employees whose contributions are paid by their employers. The third group includes other parties, such as foreigners who have been working in Indonesia for at least six months and meet the criteria for participation in the Social Security program, as well as any other individuals who do not fall into the aforementioned categories. Contribution assistance is provided by the government for those who are economically disadvantaged and underprivileged. They are participants in the Social Security program.

Figure 2.2 Comparison and Percentage of BPJS Participants and Population





Source: World Development Indicator and BPJS Financial Statement, 2024 (processed data by author)

In terms of participation, by the end of 2014 (Figure 2.3.2), the National Health Insurance (JKN) program had 133,423,653 participants, which more than doubled to 267,311,566 participants by 2023. When compared to Indonesia's total population, the percentage of JKN participants has demonstrated a consistent increase, reaching a coverage rate of nearly 100% within a decade. This growth indicates an expansion in public trust in BPJS Kesehatan and a heightened awareness about health and public health insurance.

BPJS Kesehatan defines four types of JKN or Indonesia Health Card (KIS) membership:

1. Contribution Assistance Recipients (PBI): This program covers the poor and underprivileged, with contributions paid by the central government through the state budget (APBN) and local governments through the regional budget (APBD).
2. Wage Recipients (PPU): Individuals employed by an employer who receive wages or salaries. This group includes government officials, members of local legislative councils, civil servants, military personnel, police officers, village heads and officials, private employees, and other wage earners. Family members such as the fourth and subsequent children, parents, and in-laws can be included. Contributions are 5% of the monthly salary, with 3% paid by the employer and 2% by the employee. For other participants, the contributions are 5% of the salary, with 4% paid by the employer and 1% by the employee.
3. Non-Wage Recipients (PBPU): Individuals who work independently or on a freelance basis. They must register themselves and their family members as listed on their Family Card (KK), with all family members enrolled in the same class.
4. Non-Workers (PB): This group includes individuals not classified as PPU, PBI, or PBPU, and those registered by local governments. This category includes investors, employers, retirees, veterans, freedom fighters, and others who can pay BPJS Kesehatan contributions.

Participants in the BPJS are grouped into three categories according to the level of inpatient room facility provided: Grade 1, Grade 2, and Grade 3. Despite the differences in inpatient

room facilities, all participants are guaranteed the same level of medical care. Class 1 participants pay the highest monthly contribution for access to more comfortable room facilities, whereas those in Class 3 pay the lowest contribution for rooms with simpler facilities.

The contribution rates have been subject to periodic adjustments in response to shifts in healthcare costs and economic conditions. The premium rates for BPJS health insurance have changed over the years as follows:

Table 2.2 Change in premium rates over the years

Year	2014	2016	2017-2019	2020	2021
Grade 1	Rp59.500	Rp80.000	No increase in BPJS premiums	Rp150.000	Rp150.000
Grade 2	Rp42.500	Rp51.000		Rp100.000	Rp100.000
Grade 3	Rp25.500	Rp30.000		Rp42.000	Rp35.000

Source: (Tempo.co, 2024), processed by author.

Despite the varying contribution rates, there is a discussion about eliminating the class-based system and replacing it with a Standard Inpatient Class (KRIS), ensuring equal inpatient room facilities for all participants. Nevertheless, despite this limitation, this study aims to examine the relationship between public health insurance expenditure and economic growth in Indonesia. To do so, the study uses the Total Healthcare Claim Costs variable as a proxy, which is divided into several specific categories, including:

1. Capitation: This cost is associated with the payment system where healthcare providers are paid per patient treated over a specific period, rather than per individual service rendered. Capitation aims to promote efficiency and cost control by providing fixed payments to healthcare providers based on the number of registered patients.
2. Advanced Outpatient Care (RJTL): This includes costs for more complex or specialized outpatient services. Advanced outpatient care typically involves consultations with specialists, diagnostic tests, and treatments that require higher levels of expertise and resources.

3. Advanced Inpatient Care (RITL): These costs cover inpatient services, which generally involve more intensive or prolonged care. Advanced inpatient care encompasses hospitalization, surgeries, and other significant medical interventions that require patients to stay in healthcare facilities.
4. Non-Capitation, Non-CBGs (Case Based Groups) Services: This includes costs for healthcare services that are not covered under the capitation system or case-based payment models. These services can be diverse and include various medical procedures, therapies, and treatments that do not fit into predefined categories.
5. Promotive and Preventive Services: These costs are allocated for services aimed at disease prevention and health promotion. Promotive and preventive healthcare activities include vaccinations, health education, screenings, and other initiatives designed to prevent illness and promote healthy lifestyles.

A study by Fan et al (2024) states that public health insurance, in particular, has been shown to have a greater impact on economic performance compared to commercial health insurance. This statement is one of the reasons why this study uses BPJS Health data. In addition, BPJS Kesehatan coverage has almost reached 100% Universal Health Coverage, so it can represent the majority of the Indonesian population. In conclusion, BPJS Kesehatan plays an instrumental role in the context of Indonesia's public health insurance landscape, contributing in a significant manner towards the country's progress in achieving Universal Health Coverage (UHC). The considerable expansion in both the number of participants and the scope of coverage serves to illustrate the success of the program, as well as the extent of public trust in it. Nevertheless, ongoing efforts are required to address the issues of financial sustainability, service quality, and administrative efficiency, in order to guarantee both the long-term viability and effectiveness of the BPJS Kesehatan program.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Approach

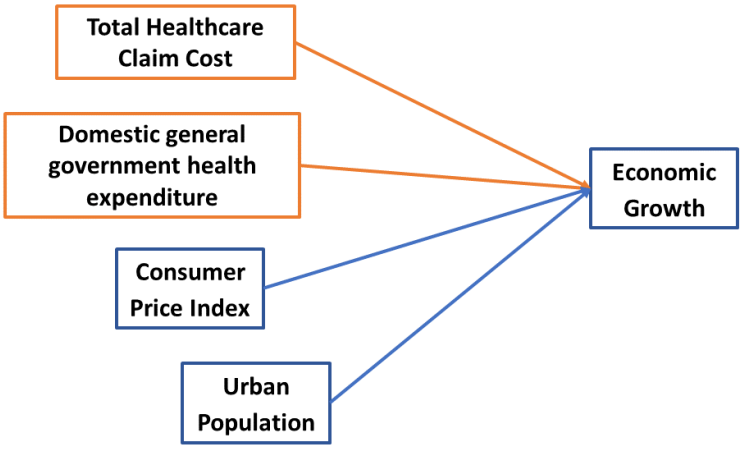
This thesis uses a quantitative research approach, which is an approach that is structured and quantifies data to be generalized (Anshori & Iswati, 2009) by using empirical data on the impact of public health insurance claim costs and government health expenditure on economic growth in Indonesia during the period 2014-2023. This study tests hypotheses with statistical analysis and obtains findings regarding the correlation between the variables studied. Quantitative techniques help to make accurate measurements of the magnitude and characteristics of the relationship, resulting in objective findings that can become scientific empirical evidence.

3.2 Empirical Model

This study employed Eviews 13 to conduct testing with the Autoregressive Distributed Lag (ARDL) approach proposed by Pesaran (2001). ARD is a model that is considered suitable and can be used to examine every relationship that occurs between independent variables and dependent variables in short-term dynamics, as well

as long-term dynamics. Using this method allows the variables to be integrated with different orders (i.e. I(0) or I(1)). Below is the conceptual framework for this model:

Figure 3.1 The Conceptual Framework



Source: Author, 2024

The conceptual framework outlines the relationships between the dependent variable (Economic Growth) and the independent variables (Total Healthcare Claim Cost, Domestic General Government Health Expenditure, Consumer Price Index, and Urban Population). The ARDL model can be expressed as follows:

$$\Delta GDPPERCAPITA_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \Delta GDP_{t-i} + \sum_{j=0}^{q} \gamma_j \Delta CLAIM_{t-j} + \sum_{k=0}^{r} \delta_k \Delta DOMESTIC_{t-k} + \sum_{l=0}^{s} \gamma_l \Delta URBAN_{t-1} + \sum_{m=0}^{t} \theta_m \Delta IHK_{t-m} + \lambda_1 GDP_{t-1} + \lambda_2 CLAIM_{t-1} + \lambda_3 DOMESTIC_{t-1} + \lambda_4 URBAN_{t-1} + \lambda_5 IHK_{t-1} + \epsilon_t$$

Where:

- ΔGDP_t represents the first difference of GDP per capita at time t, indicating the change in economic growth.
- $CLAIM_t$ is the total healthcare claim cost at time t.
- $\Delta DOMESTIC_t$ is the domestic general government health expenditure as a percentage of general government expenditure at time t.
- $\Delta URBAN_t$ denotes the urban population at time t.
- $\Delta IHK_t$is the consumer price index at time t.
- α_0 is the constant term.
- β_i , γ_j , δ_k , γ_l , θ_m are the short-run coefficients.
- λ_1 , λ_2 , λ_3 , λ_4 , λ_5 are the long-run coefficients.
- ϵ_t is the error term.

This model allows for the examination of both immediate (short-run) effects and enduring (long-run) relationships between the economic growth of Indonesia and the selected explanatory variables. The ARDL approach is particularly advantageous in this context due to its flexibility with mixed order integrations and its ability to provide unbiased long-run estimates. The following are the variable descriptions and data sources:

Table 3.1 The Operational Definitions of Each Variable and The Sources

Variables	Definition	Unit	Data Source
GDPPERCAPITA	GDP per capita is the measure of a country's economic output divided by its midyear population.	Current US$	World Development Indicator, published by World Bank
CLAIM	Total Healthcare Claim Costs refers to the total amount of money claimed by individuals or healthcare providers under the public health insurance scheme (BPJS) for healthcare services provided.	Million rupiah	BPJS Kesehatan Financial Report
DOMESTIC	government spending has a function to advance domestic health, so that this spending is a portion of the overall government spending which is an	% of general government expenditure	World Development Indicator,

	allocation in the health sector. This is a reflection of how much priority is given by the government to utilize domestic public resources used for health purposes.		published by World Bank
URBAN	Population in various urban areas Refers to every individual who has ever lived in an urban area, this is in accordance with the definition applied by the national statistical office. In addition, the acquisition of this total number is obtained based on estimates of the World Bank's overall population, as well as the urbanization ratio. This ratio is taken from the World Urbanization Prospects initiated by the United Nations.	Urban Population	World Development Indicator, published by World Bank
IHK	The total number of urban residents can be interpreted as someone who has lived in an urban area for a long time, those who live there according to the definition previously set by the Central Bureau of Statistics. Thus, the total number living in the area will be calculated based on global population estimates previously provided by the World Bank, in addition, the proportion of data from this urbanization is taken from the World Urbanization Prospect which has been released by the United Nations	Index	Badan Pusat Statistik (BPS)

Source: Author, 2024.

3.3 Object and Subject of Research

The object of this study is the economic growth of Indonesia, represented by GDP per capita, and its relationship with the primary health expenditure variables, demographic and economic variables. This research aims to elaborate of how public health insurance

claim costs and government health expenditure influence economic growth over the period from 2014 to 2023. Additionally, this study considers the impact of the urban population and consumer price index as controlling variables to provide a comprehensive analysis of the economic dynamics in Indonesia.

The subjects of this study are BPJS Kesehatan, Indonesia's public health insurance system, and the country of Indonesia itself. BPJS Kesehatan is essential for understanding the total healthcare claim costs, representing the financial claims made under the public health insurance system. The country of Indonesia is the broader context within which this study examines the domestic general government health expenditure, the urban population, and the consumer price index.

3.4 Data Processing and Analysis Techniques

This study employs EViews 13 software for the data analysis, leveraging its advanced features for econometric modeling and statistical testing. The data for this study was collected primarily from secondary sources, consisting of time series data ranging from 2014 to 2023. Not all data used in this research is directly obtained from primary sources; some data is derived through statistical interpolation and forecasting methods. These secondary data will be processed and analyzed involving several steps:

1. Interpolation

   The interpolation technique used in this thesis extends the method developed by Insukindro (1990) for deriving quarterly data from annual data. Interpolation is a method used to estimate time series data with a larger time interval (such as annual data) into smaller intervals (such as quarterly or monthly data).

   In this research, interpolation is applied to estimate quarterly values from annual data. All variables except for the Consumer Price Index (CPI) serve this interpolation process, including GDP per Capita, Total Healthcare Claim Costs, Domestic General Government Health Expenditure, and Urban Population. The interpolation is conducted using EViews 13 software. The following formulas are used for data interpolation:

   - $Y_{t1} = \frac{1}{4}\left(Y_t - \frac{4.5}{12}(Y_t - Y_{t-1})\right)$
   - $Y_{t2} = \frac{1}{4}\left(Y_t - \frac{1.5}{12}(Y_t - Y_{t-1})\right)$

- $Y_{t3} = \frac{1}{4}\ (Y_t + \frac{1.5}{12}(Y_t - Y_{t-1}))$
- $Y_{t4} = \frac{1}{4}\ (Y_t + \frac{4.5}{12}(Y_t - Y_{t-1}))$

These formulas are applied to break down annual data into quarterly estimates, ensuring a more granular and precise analysis of the time series data.

2. Descriptive Statistics

   Descriptive statistics offer a concise overview of the fundamental characteristics of the data in a study. Measures such as mean, median, standard deviation, and range provide a basic understanding of the central tendency and spread of the variable under examination (Gujarati, 2004).

3. Stationarity Test

   By determining whether the variables fluctuate around a constant mean and variance over time, it is essential to execute stationarity tests such as the Augmented Dickey-Fuller (ADF) test as non-stationary data can lead to spurious regression results, affecting the reliability of the findings (Maruddani, 2004). Stationarity ensures that the statistical properties of the variables remain consistent over time. Providing a solid foundation for further analysis.

4. Optimum Lag Length Test

   Following the stationary test, an optimum lag length test is conducted to identify the most appropriate lag length for subsequent analyses. This step is crucial to capture the dynamin nature of the variables accurately (Gujarati, 2004). The selection of the optimum lag ensures that the model can adequately reflect the temporal relationships among the variables without overfitting. The lag length is determined using criteria such as the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC), which help in selecting model that best balances complexity and explanatory power.

5. Cointegration ARDL Bound Test

   The existence of a long-term equilibrium relationship between the variables to be researched can be determined by conducting a cointegration test. Tes ini memiliki kegunaan untuk melakukan pengukuran, sehingga

mengukur jangka pendek,variabel yang bergerak dalam jangka panjang dapat diketahui secara bersamaan. Identifying cointegration is critical as it indicates that the variables share a common trend and any deviations from this trend are temporary. This test compares the calculated F-statistic against critical value bounds for the I(0) and I(1) cases. If the F-statistic is less than the critical value of the upper bound (I(1)), it indicates that the variables are not cointegrated. In the case where the data is stationary and not cointegrated, the ARDL model is suitable for further analysis.

6. Classical Assumption Test

After establishing cointegration, several diagnostic tests are carried out to validate the model. These tests ensure the robustness and reliability of the model:

- Normality Test

Whether data is normally distributed or not can be determined through a normality test. According to Ghozali (2012), the significance of the impact of exogenous variables on the endogenous variable is valid only if the residuals are normally distributed. Therefore, for this purpose, the Jarque-Bera Test is needed so that it can be known that the data has been normally distributed if the resulting probability value exceeds $\alpha = 0.05$.

- Autocorrelation Test

Ghozali (2012) provides an explanation that this test is carried out to find out whether or not there is a correlation resulting from the previous period with the residuals in the current period, so that this explanation becomes the goal obtained from the autocorrelation test. The decision rule for the autocorrelation test is that if the Chi-Square probability value is greater than $\alpha = 0.05$, it indicates that there is no autocorrelation problem in the model.

- Heteroskedasticity Test

The heteroskedasticity test is used to check whether the variance of the residuals is constant across observations. According to Ghozali (2012), this test is essential to ensure that the model does not suffer from heteroskedasticity. The decision rule for this test is that if the probability value from the Breusch-Pagan LM Test is greater than $\alpha = 0.05$, it indicates the absence of heteroskedasticity in the model.

- Multicollinearity Test

The multicollinearity test assesses whether there is any correlation among the independent variables. A good regression model should have no multicollinearity Ghozali (2012). Multicollinearity can be detected using the tolerance value or the Variance Inflation Factor (VIF). If the VIF value does not exceed 10, it can be concluded that there is no multicollinearity in the model.

7. Autoregressive Distributed Lag Method (ARDL)

The main analysis technique used in this study is the Autoregressive Distributed Lag (ARDL) model. This model allows to see the effect over time between the independent variable and the dependent variable, as well as allowing to see the effect of the dependent in the past time on the current dependent (Gujarati & Porter, 2009). The advantage of this ARDL method is in combining the lagged values of the dependent and independent variables together. This can provide a comprehensive picture of the interaction of variables over time. Gujarati and Porter (2009) explain that there are three main reasons for including lags in the ARDL model, namely:

(1) Psychological reasons where reactions to changes take time
(2) Technical reasons relating to the gradual adjustment to new information,
(3) Institutional reasons where policies and practices may have built-in delays.

Another advantage of ARDL is the ability to estimate long-run relationships, regardless of whether the variables are stationary at level I(0) or first difference I(1). This model can be used even if the variables are not cointegrated at the same order, making it flexible for various types of data series (Ridzuan, 2019).

8. Goodness of Fit

- R-Squared (R^2): Various proportions of the variants in the dependent variable from the independent variable can be predicted through this measurement statistic. Thus, the fit of the resulting model can be said to be better with the data if the resulting R2 value tends to be higher.

- F-Test: The F-test evaluates the overall significance of the model. This test is carried out with the aim of determining whether there is a significant relationship between the explanatory variables and the dependent variables. A significant F-test indicates that the model provides a better fit than a model with no predictors.
- T-Test: The significance value of the individual regression coefficient can be assessed by conducting a t-test. This test is conducted with the aim of finding out whether each coefficient has a significant enough difference from zero, so that this shows that independent variables that have suitability tend to have a significant impact on the dependent variable.

9. Robustness Test

Robustness testing is a trial process conducted to verify the robustness of the research model and ensure the validity and absence of bias in the results (Ferreira & Fernandes, 2017). In conducting robustness tests, there are various methods that can be applied, one of which is by using substitution techniques (Sepriani et al., 2022). Substitution in the robustness test is conducted by replacing the dependent variable. In this study, the robustness test was conducted by replacing GDP per capita with Indonesia's Real Gross Domestic Product and also Nominal Gross Domestic Product whose data were obtained from the Federal Reserve Bank of St. Petersburg.

CHAPTER 4
FINDINGS

4.1 Result

4.1.1 Descriptive Statistics

The descriptive statistics for the variables in this study provide a foundational understanding of their central tendencies and dispersions which is shown in the following table:

Table 4.1 Descriptive Statistics

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Count
GDP per capita (in U.S. dollars)	4054.923	3932.525	522.6043281	3368.13	4942.36	10
Domestic general government health expenditure (% of general government expenditure)	7.92	8.18	1.53	5.34	10.103	7
Total Healthcare Claim Costs (in million rupiah)	91236180.1	92315318	32556401.19	42658702	158852396	10
IHK	120.0255	118.74	11.01290268	104.72	139.07	40
Urban Population	147560543	147754731	8522657.797	134866535	159608946	9

Source: Author, 2024

The GDP per capita for Indonesia, measured in U.S. dollars, exhibits a mean value of 4054.923, with a standard deviation of 522.604. The data ranges from a minimum of 3368.13 to a maximum of 4942.36, indicating moderate variability around the mean, which is consistent with the country's economic fluctuations over the observed period.

The domestic general government health expenditure as a percentage of general government expenditure shows a mean of 7.923, with a standard deviation of 1.529. The minimum value recorded is 5.335, while the maximum is 10.103. This variation reflects the government's differing levels of financial commitment to health over the years, highlighting periods of both higher and lower investment in the health sector. Total healthcare claim costs, measured in million rupiah, have a mean value of 91,236,180.1, with a standard deviation of 32,556,401.19. The values range significantly from a minimum of 42,658,702 to a maximum of 158,852,396, indicating high variability. This wide range suggests fluctuations in healthcare costs, possibly due to varying levels of healthcare demand and cost management practices over time.

The consumer price index (CPI), indicated by IHK, presents a mean of 120.0255 with a standard deviation of 11.013. The CPI values range from 104.72 to 139.07, reflecting moderate inflation variability over the period. This suggests that while there is some fluctuation in consumer prices, the changes are within a relatively predictable range. Lastly, the urban population data show a mean of 147,560,543, with a standard deviation of 8,522,657.797. The values range from 134,866,535 to 159,608,946, indicating a steady increase in urban population over the years. This growth in urban population could have various implications for economic growth, urban planning, and resource allocation.

4.1.2 Unit Root Test

To ensure the stationarity of the variables used in this study, the Augmented Dickey-Fuller (ADF) unit root test was employed. The results of the ADF tests for the level and first difference of each variable are presented below:

Table 4.2 Augmented Dickey-Fuller Unit Root Test Results

Variable	Level/ First diff	t-statistics	Prob
GDP per Capita (LN_GDPPERCAPITA)	First diff	-3.24	0.0252**
Total Healthcare Claim Cost (LNCLAIM)	Level	-3.45	0.015**
Domestic	First diff	-6.01	0.00***
Urban Population (LN_URBAN)	Level	-2.20	0.0283**

Consumer Price Index (IHK)	First diff	-5.96	0.0001***

*** indicates significance at the 1% level

** indicates significance at the 5% level

Source: EViews 13 (processed data)

The results of the ADF test show that all variables are not stationary at level, but become stationary after differencing once, except for the total cost of health service claims and urban population which are stationary at level. Since the stationary test results vary but are still significant at the level and first difference, this justifies the use of the ARDL model for further analysis, as this model can handle variables integrated at zero order, I(0), and first order, I(1).

4.1.3 Cointegration Test

To assess the long-term equilibrium relationship among the variables, the Johansen cointegration test was conducted. The results are summarized in Table 4.1.3.1 below:

Table 4.3 Johansen Cointegration Test Results

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LN_GDPPERCAPITA	-3.158476	0.5387	-9.897705	0.8805
LNCLAIM	-3.743638	0.2808	-20.40407	0.2933
LN_DOMESTIC	-2.423178	0.8475	-13.77151	0.6810
LN_URBAN	-3.524878	0.3705	-15.92703	0.5436
IHK	-2.645207	0.7697	-12.43218	0.7586

*MacKinnon (1996) p-values

Source: EViews 13 (processed data)

The null hypothesis of no cointegration could not be rejected for any of the variables at the 5% significance level, as indicated by the probability values. This suggests that there is no long-term equilibrium relationship among GDP per capita, total healthcare claim costs, domestic general government health expenditure, urban population, and the consumer price index. The absence of cointegration implies that while the variables may exhibit short-term relationships, they do not move together in the long run. This finding is important for the application of the ARDL model, which allows for the estimation of both

short-run dynamics and long-run relationships without requiring the variables to be cointegrated.

The Bounds Test was also conducted to test the existence of a long-run relationship between the variables. The results are summarized in Table 4.1.3.2 below:

Table 4.4 Bound Cointegration Test Results

Test Statistic	Value
F-statistic	7.048653

Source: EViews 13 (processed data)

The critical values for the Bounds Test are presented in Table 4.1.3.3 These values help determine whether the computed F-statistic indicates a long-term relationship.

Table 4.5 Critical Values for Bounds Test Results

Significance Level	I(0) Bound	I(1) Bound
10%	2.460	3.460
5%	2.947	4.088
1%	3.860	5.532

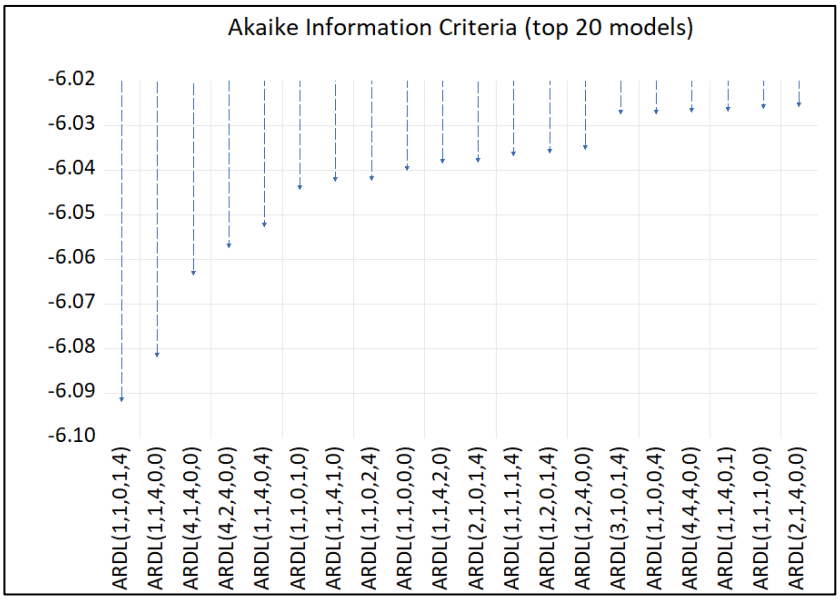
Source: EViews 13 (processed data)

The null hypothesis of the Bounds Test states that there is no long-term relationship among the variables. The calculated F-statistic value of 7.048653 is compared against the critical values for different significance levels. Since the F-statistic exceeds the upper bound critical values at the 1%, 5%, and 10% significance levels (F-stat > critical values), we reject the null hypothesis of no cointegration. This implies that there is a long-term equilibrium relationship among the variables in the model. The presence of cointegration suggests that the variables move together in the long run, justifying the use of an ARDL model to capture both short-term dynamics and long-term relationships.

4.1.4 Optimum Lag Length Test

To determine the optimal lag length for the ARDL model, the Akaike Information Criteria (AIC) is used. The top 20 models based on AIC values are presented in Figure 4.1.4.

Figure 4.1 Akaike Information Criteria Optimum Lag Length Test Results



Source: EViews 13

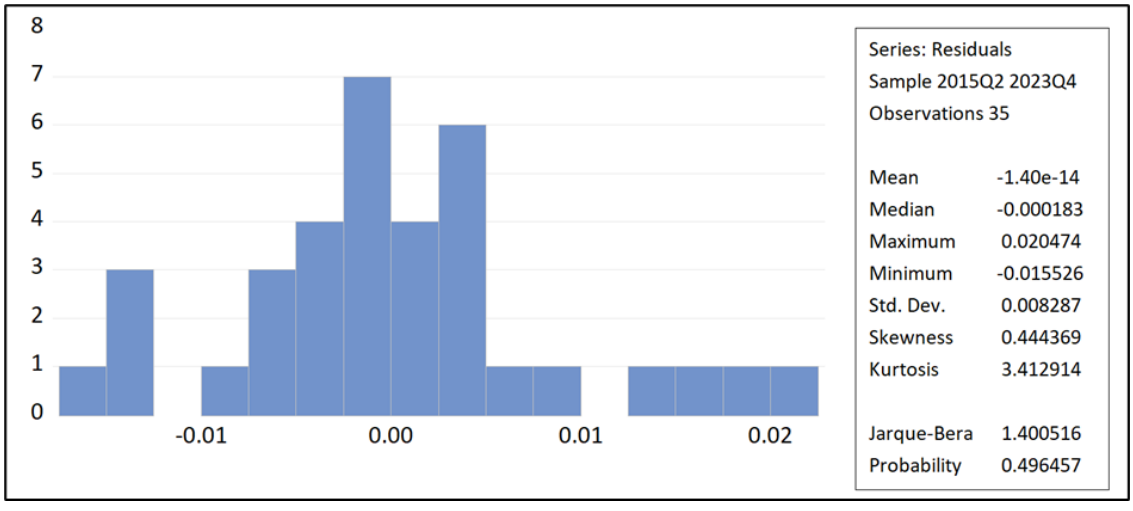
The figure above is the result of the Akaike Information Criteria test which displays 20 ARDL model options with various lag structures. The lower the AIC value of the models, the more optimal it is to use, as it can balance between model complexity and model fit. In the figure above, the one with the lowest AIC value is the ARDL (1,1,0,1,4) model, which means it is the most suitable model to use in our study. This ARDL model with optimal lag structure will be used in further ARDL analysis to ensure accuracy. Because the selection of lag length can affect the ability of the model to capture the dynamics and underlying relationships between variables.

4.1.5 Classical Assumption Test

- Normality Test

  The normality test was conducted on the residuals of the ARDL model to ensure that they are normally distributed. The results of the normality test, including the histogram of the residuals and the summary statistics, are presented in Figure 4.2.

Figure 4.2 Normality Test Results



Source: EViews 13

The Jarque-Bera test statistic is 1.400516, with an associated probability value of 0.496457. Since the probability value is greater than 0.05, we fail to reject the null hypothesis that the residuals are normally distributed. This indicates that the residuals of the ARDL model do not deviate significantly from a normal distribution, satisfying the assumption of normality. Ensuring normality of the residuals is crucial for the validity of the ARDL model, as it affects the reliability of statistical inferences drawn from the model.

- Autocorrelation Test

The Breusch-Godfrey Serial Correlation LM Test was conducted to check for the presence of autocorrelation in the residuals of the ARDL model. The results are summarized in Table 4.1.5.1.

Table 4.6 The Breusch-Godfrey Serial Correlation LM Test Results

Test Statistic	Value	Probability
F-statistic	0.490576	0.7427
Obs*R-squared	3.276390	0.5127

Source: EViews 13 (processed data)

The null hypothesis of the Breusch-Godfrey test states that there is no serial correlation up to the specified lag order. In this case, the test was conducted with up to 4 lags. The F-statistic value is 0.490576 with a probability of 0.7427, and the Obs* R S-squared value is 3.726390 with a probability of 0.5127. Both probability values are greater than 0.05 (prob > 0.05), indicating that we fail to reject the null hypothesis of no serial correlation. This satisfies the assumption of no autocorrelation, which is important for the validity of the model's estimates and inferences.

- Heteroscedasticity Test

The Breusch-Pagan-Godfrey test was conducted to check for the presence of heteroscedasticity in the residuals of the ARDL model. The results are summarized in Table 4.1.5.2:

Table 4.7 The Breusch-Pagan-Godfrey Test Results

Test Statistic	Value	Probability
F-statistic	0.651366	0.7674
Obs* R-squared	8.313463	0.6850
Scaled explained SS	4.331251	0.9592

Source: EViews 13 (processed data)

The null hypothesis of the Breusch-Pagan-Godfrey test states that there in homoscedasticity, indicating constant variance of the residuals. The F-statistic values is 0.651366 with a probability of 0.7674, the Obs* R-squared values is 8.313463 with a probability of 0.6850, and the scaled explained SS value is 4.331251 with a probability of 0.9592. All probability values are greater than 0.05, meaning that we fail to reject the null of homoscedasticity, there is no significant heteroscedasticity in the residuals of the ARDL model.

4.1.6 ARDL Model Estimation

From the stationarity test results which show that the variables used in this study are integrated at order level, I(0), and order one, I(1), as well as due to the presence of cointegration indicating that the variables move together in the long run, these two things justify the use of the ARDL model to capture short-term dynamics and long-term relationships. Furthermore, the previous lag optimum test suggests that the ARDL (1,1,0,1,4) model is the most suitable for our analysis. Specifically, the variable D(LN_GDPPERCAPITA) has one lag, LNCLAIM has one lag, D(LN_DOMESTIC) has zero lag, LN_URBAN has one lag, and D(CPI) has four lags. The subsequent step is the estimation of the ARDL model. This estimation yields two results: a short-term and a long-term estimation. The following are the results of the short-term estimation of the ARDL model during the period from the first quarter of 2014 to the fourth quarter of 2023:

Table 4.8 ARDL Short-term Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LN_GDPPERCAPITA(-1))	0.301630	0.142131	2.122195	0.0448**
LNCLAIM	-0.000677	0.000629	-1.075535	0.2933
LNCLAIM(-1)	0.001840	0.000590	3.118104	0.0048***
D(LN_DOMESTIC)	0.000104	0.000841	0.124236	0.9022
LN_URBAN	2.220239	1.322110	1.679315	0.1066

LN_URBAN(-1)	-2.201429	1.276738	-1.724261	0.0981*
D(IHK)	0.001744	0.000349	5.000165	0.0000***
D(IHK(-1))	-2.88E-05	0.000457	-0.063092	0.9502
D(IHK(-2))	8.50E-05	0.000322	0.263835	0.7943
D(IHK(-3))	-7.40E-06	0.000307	-0.024114	0.9810
D(IHK(-4))	-0.001086	0.000406	-2.673870	0.0136**
C	-0.395246	1.150812	-0.343450	0.7344
R-squared	0.835546			
Adjusted R-squared	0.756893			
S.E. of regression	0.010076			
Sum squared resid	0.002335			
Log likelihood	118.6010			
F-statistic	10.62331			
Prob(F-statistic)	0.000001			

* indicates significance at the 10% level

** indicates significance at the 5% level

Source: EViews 13 (processed data)

The selection of the ARDL (1,1,0,1,4) model indicates an excellent fit, as evidenced by the resulting R-squared value of 0.8335546 and the probability (F-statistic) showing significant at the 1% level. It can thus be stated that approximately 83.55% of the variation in GDP per capita can be attributed to the independent variables included in the model. The dependent variable, GDP per capita, is found to be significantly positive at the 5% level on lag 1. The model indicates that past changes in GDP per capita exert a positive influence on current changes in GDP per capita. This indicates the presence of a momentum effect in economic growth, whereby previous growth tends to result in further growth in the short term.

In examining the independent variables, we observe significant results for multiple variables at varying levels of significance. However, the variable D(LN_DOMESTIC) exhibits a probability of 0.9022, indicating that direct changes in health expenditure do not demonstrate a statistically significant impact on GDP per capita in the short run. In contrast, the variable total healthcare claim costs (LNCLAIM) exhibits significance at the 1% level for lag 1 (LNCLAIM(-1)) ($p = 0.0048$). The lagged coefficient is positive and statistically significant,

indicating that healthcare claim costs from the previous period have a positive impact on GDP per capita. This could imply that expenditure on public health insurance has resulted in delayed economic benefits, potentially through improvements in public health and productivity. The coefficient for the current period is negative but not statistically significant, implying that an immediate change in the cost of public health claims does not have a significant impact on GDP per capita.

Current period coefficient of Urban Population (LN_URBAN) is positive but not statistically significant. While urban population at lag 1 shows a negative and statistically significant coefficient. This may indicate that immediate changes in urban population do not significantly affect GDP per capita, but past changes in urban population may have a delayed negative impact on GDP per capita.

Consumer Price Index is highly significant in the current period (D(CPI)) and the fourth lag (D(CPI(-4))) with positive and negative coefficients, respectively. Indicating that an immediate increase in CPI has a positive impact on GDP per capita. This may suggest that moderate inflation is associated with economic growth. Meanwhile, the negative and significant coefficient of the fourth lag implies that the effect of inflation from four periods ago has a negative impact on GDP per capita. This delayed negative effect may indicate that prolonged inflation will eventually hamper economic growth. Furthermore, the results of the ARDL long-term estimation can be seen in table 4.1.6.2:

Table 4.9 ARDL Long-term Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCLAIM(-1)	0.001666	0.000916	1.818471	0.0790*
D(LN_DOMESTIC)	0.000150	0.001204	0.124149	0.9020
LN_URBAN(-1)	0.026934	0.084570	0.318484	0.7523
D(IHK(-1))	0.001012	0.001428	0.708651	0.4840
C	-0.565955	1.594052	-0.355042	0.7250

Source: EViews 13 (processed data)

Total Healthcare Claim Cost (LNCLAIM(-1)) shows a positive coefficient and is slightly significant at the 10% level, so it can be interpreted that in the long run, an increase in total healthcare claim cost is associated with an increase in GDP per capita. This could be due to the fact that higher healthcare claim costs may reflect greater investment in healthcare services, which improves people's health and productivity, thereby increasing

economic growth. Apart from the total healthcare claim cost variable, other independent variables and control variables show positive coefficients but are not statistically significant.

4.1.7 Robustness Test

Using the same steps as before, at this robustness test stage, we created two other models using Real GDP and Nominal GDP as independent variables, whose data was obtained from the Federal Reserve Bank of St. Petersburg, to test whether the previous model used in this study is robust enough. After conducting the Akaike info criterion (AIC) test, the selected model for the Real GDP model is ARDL(4,3,4,4,3). The following are the results of Short term ARDL with the dependent Real GDP Indonesia in 2014-2023:

Table 4.10 ARDL Short-term Result (Y = Real GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob
D(LN_REALGDP(-1))	-0.837754	0.145079	-5.774456	0.0001***
D(LN_REALGDP(-2))	-0.645584	0.153378	-4.209099	0.0015***
D(LN_REALGDP(-3))	-0.445870	0.255373	-1.745961	0.1086
D(LN_REALGDP(-4))	-0.409280	0.225263	-1.816897	0.0966*
LNCLAIM	0.000108	5.26E-05	2.047825	0.0652*
LNCLAIM(-1)	0.000113	5.39E-05	2.092645	0.0604*
LNCLAIM(-2)	0.000277	8.62E-05	3.212011	0.0083***
LNCLAIM(-3)	0.000116	4.28E-05	2.715724	0.0201**
LN_URBAN	0.888200	0.513712	1.728985	0.1117
LN_URBAN(-1)	-1.437366	0.916774	-1.567852	0.1452
LN_URBAN(-2)	-1.618247	2.030551	-0.796950	0.4423
LN_URBAN(-3)	5.442168	4.157629	1.308960	0.2172
LN_URBAN(-4)	-3.242663	2.192046	-1.479286	0.1671
D(IHK)	0.000529	4.04E-05	13.08401	0.0000***
D(IHK(-1))	0.002500	0.000353	7.071654	0.0000***
D(IHK(-2))	0.001671	0.000414	4.040089	0.0019***
D(IHK(-3))	0.001073	0.000325	3.298723	0.0071***
D(IHK(-4))	0.000695	0.000345	2.014031	0.0691*
D(LN_DOMESTIC)	-4.51E-05	0.000198	-0.227606	0.8241
D(LN_DOMESTIC(-1))	0.002438	0.002134	1.141989	0.2777
D(LN_DOMESTIC(-2))	0.000557	0.000300	1.858670	0.0900*
D(LN_DOMESTIC(-3))	-0.000825	0.000525	-1.571805	0.1443
C	-0.597388	0.137063	-4.358479	0.0011
R-squared	0.999429			
Adjusted R-squared	0.998287			
S.E. of regression	0.000663			
Sum squared resid	4.83E-06			
Log likelihood	219.7873			

F-statistic	875.0902
Prob(F-statistic)	0.000000

* indicates significance at the 10% level

** indicates significance at the 5% level

*** indicates significance at the 1% level

The results of the short-run analysis with Real GDP as the dependent are that the coefficient of insurance claims (LNCLAIM) remains positive and significant in some lags (LNCLAIM(-1), (-2), and (-3)), suggesting that insurance claims have a lasting and consistent impact on increasing Real GDP. Inflation (D(CPI)) shows very high significance in all lags, with a positive coefficient, suggesting that inflation, in the context of Real GDP, may be driving economic activity in the short run. D(LN_DOMESTIC) or government Health expenditure is insignificant, suggesting that government health expenditure may not have a direct effect on Real GDP in the short run. Here are the long-term results:

Table 4.11 ARDL Long-term Result (Y = Real GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCLAIM(-1)	0.000184	2.41E-05	7.617535	0.0000***
LN_URBAN(-1)	0.009613	0.001618	5.939596	0.0000***
D(IHK(-1))	0.001938	0.000216	8.984591	0.0000***
D(LN_DOMESTIC(-1))	0.000636	0.000432	1.474232	0.1512
C	-0.178940	0.030573	-5.852783	0.0000

* indicates significance at the 10% level ** indicates significance at the 5% level

*** indicates significance at the 1% level

LNCLAIM(-1) shows significant and positive, it can be interpreted that health insurance claims have a consistent and significant impact on inflation-adjusted economic growth in the long run. Meanwhile, LN_URBAN(-1) and D(CPI(-1)) show high significance with positive coefficients, indicating that urbanization and inflation contribute to inflation-adjusted economic growth in the long run. The second model used for robustness test is using Nominal GDP as the dependent variable. The model selected in the Akaike test is ARDL(4,0,2,3,4). Here are the short-term results:

Table 4.12 ARDL Short-term Result (Y = Nominal GDP)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LN_NOMGDP(-1)	0.821371	0.267303	3.072811	0.0066***
LN_NOMGDP(-2)	-0.006427	0.148000	-0.043425	0.9658
LN_NOMGDP(-3)	0.695033	0.304692	2.281102	0.0349**

LN_NOMGDP(-4)	-1.059566	0.349663	-3.030248	0.0072***
LNCLAIM	0.000199	0.000691	0.288377	0.7764
LN_DOMESTIC	-0.003427	0.001761	-1.945732	0.0675*
LN_DOMESTIC(-1)	0.004679	0.001181	3.961698	0.0009***
LN_DOMESTIC(-2)	-0.007993	0.002832	-2.822346	0.0113**
LN_URBAN	22.24443	8.996329	2.472612	0.0236**
LN_URBAN(-1)	-39.26088	14.23093	-2.758842	0.0129**
LN_URBAN(-2)	6.871352	5.963731	1.152190	0.2643
LN_URBAN(-3)	11.62616	4.801868	2.421174	0.0263**
IHK	0.000546	0.000458	1.193544	0.2482
IHK(-1)	-0.000722	0.000504	-1.433967	0.1687
IHK(-2)	0.000901	0.000567	1.589425	0.1294
IHK(-3)	0.000278	0.000485	0.572965	0.5738
IHK(-4)	0.001969	0.000636	3.097543	0.0062***
C	-15.92221	20.26957	-0.785523	0.4424

R-squared	0.998017
Adjusted R-squared	0.996145
S.E. of regression	0.011751
Sum squared resid	0.002485
Log likelihood	121.3729
F-statistic	532.9914
Prob(F-statistic)	0.000000

* indicates significance at the 10% level

** indicates significance at the 5% level

*** indicates significance at the 1% level

In the Short-Term ARDL results with Nominal GDP as the dependent variable, it is found that LN_NOMGDP(-1), LN_NOMGDP(-3), and LN_NOMGDP(-4) have significant coefficients indicating that the past value of Nominal GDP has a strong influence on the current Nominal GDP. The coefficient for LNCLAIM in the short run is not significant, which suggests that health insurance claims may not have a strong direct impact on Nominal GDP. This may be because Nominal GDP reflects the value of total economic output in current prices, which may be more influenced by other factors such as inflation or other sector expenditures that are more dominant in nominal terms. LN_DOMESTIC(-1) shows a significant and positive result, indicating that government health expenditure in the previous period has a positive impact on current Nominal GDP. However, government health expenditure at another lag (LN_DOMESTIC(-2)) shows negative significance. This could indicate the existence of non-linear spending dynamics,

where the effect of health spending may have a different impact depending on the timing and magnitude of the spending.

LN_URBAN shows significant and positive coefficients in most lags, indicating that urbanization drives the increase in Nominal GDP. However, there are also significant negative coefficients on other lags, which could indicate that poorly managed urbanization can put pressure on the economy, such as congestion or lack of infrastructure that can reduce economic efficiency. Inflation at lag 4 (CPI(-4)) is significant and positive, suggesting that inflation in previous periods may affect current Nominal GDP. This may be related to rising prices driving an increase in the nominal value of output, although it does not necessarily reflect a real economic increase in terms of output volume. In the Long-Term ARDL results with Nominal GDP as the dependent variable, only one variable shows a positive significance, namely LN_URBAN(-1). Below is a table of the Long-Term ARDL results in question:

Table 4.13 ARDL Long-term Result (Y = Nominal GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCLAIM	0.000363	0.001298	0.279258	0.7819
LN_DOMESTIC(-1)	-0.012267	0.016271	-0.753882	0.4566
LN_URBAN(-1)	2.694850	0.937560	2.874323	0.0073***
IHK(-1)	0.005408	0.005150	1.050140	0.3018
C	-28.97111	17.51975	-1.653626	0.1083

The coefficient of LNCLAIM is not significant (p-value = 0.7819) in the long run, indicating that health insurance claims do not have a significant impact on Nominal GDP in the long run. This may be because Nominal GDP is more influenced by factors that affect prices and the overall amount of economic output. The coefficient of LN_DOMESTIC(-1) is also insignificant, indicating that government health spending may not have a direct impact on Nominal GDP in the long run. Inflation (CPI(-1)) in the long run is also insignificant, which may indicate that although inflation affects Nominal GDP in the short run, this effect may not be sustainable or absorbed by the economy in the long run. Whereas LN_URBAN(-1) is significant and positive which suggests that in the long run, urbanization boosts Nominal GDP growth.

The results of the three models show that health insurance claims contribute positively to economic growth, especially in terms of individual welfare (GDP per capita) and real economic output (Real GDP). In contrast, the effect on Nominal GDP is insignificant, indicating that the main impact of insurance claims is on increasing

productivity and capacity of the real economy rather than simply increasing the nominal value of the economy. Government health spending needs to improve its efficiency to contribute more to economic growth. The inconsistent impact suggests that there is room for improvement in the allocation and management of these expenditures, especially to ensure that the impact is not only short-term but also sustainable in the long run.

Urbanization shows significant results in boosting Nominal GDP in the short and long run, which is consistent with research showing that urbanization increases economic concentration, innovation, and productivity efficiency. Research such as that conducted by Zhang & Xie (2019) supports this finding by showing that urbanization contributes significantly to economic growth through the mechanism of economic agglomeration. The significant effect of inflation in the short-run and insignificant in the long-run is consistent with the literature that suggests that inflation may drive nominal growth in the short-run, but does not necessarily reflect real economic growth in the long-run (Ayonete, 2023). Inflation that is overly high can be harmful, but at moderate levels, inflation can increase the nominal value of GDP.

4.2 Discussion

4.1.1 Public Health Insurance Claims and Its Impact on Economic Growth in Indonesia

Our analysis of the total cost of healthcare claims as public health insurance proxy and its relationship with GDP per capita in Indonesia reveals notable fluctuations. From the results of the study using the ARDL model, it appears that there is a positive effect of health insurance claim costs on economic growth, especially in the long run. In the short term, the delayed valuation of healthcare claims costs has a positive and statistically significant impact on GDP per capita. This result is in line with the hypothesis of this study which states that public health insurance claim costs have a positive effect on Indonesia's economic growth. When health insurance claims increase, more people will gain access to the healthcare they need. Although the ARDL model does not explicitly incorporate a production function, the results show that health spending indirectly increases GDP through an increase in Total Factor Productivity (A) and effective labor (L). Increased health spending has a positive impact on the economy by improving the health of the workforce, which in turn increases productivity and output. When people receive adequate health care, they become healthier, resulting in less sickness, less absenteeism, and increased labor productivity. This increase in productivity indirectly contributes to economic growth as a healthier workforce can work more effectively and efficiently. This finding corroborates the delayed economic benefits of healthcare investment, in accordance with the principles

of endogenous growth theory which states that investment in healthcare increases economic productivity by improving the health and efficiency of the workforce.

In this context, the Indonesian public health insurance system, BPJS (Badan Penyelenggara Jaminan Sosial), is of particular importance. The total healthcare claims cost data obtained from the annual BPJS Financial Report, which was utilized in this study, encompasses a comprehensive range of healthcare expenditures, including capitation, advanced outpatient care (RJTL), advanced inpatient care (RITL), non-capitation/non-DRG services, and prevention and promotion services. Each of these components represents a distinct aspect.

Regardless, collectively, total healthcare claim costs have a significant impact on economic growth, including all of its components. Premium payments, for instance, ensure uninterrupted access to primary healthcare services and thus the overall health of the population. It also includes regular access to primary healthcare services that facilitate early diagnosis and treatment of diseases. Such access can both reduce the incidence of health complications and minimize the financial burden associated with long-term care. Spending on advanced outpatient care (OOP) and advanced inpatient care (RITL) has the effect of addressing more serious health problems, such as chronic diseases and acute conditions that require more intensive medical intervention. When such illnesses are effectively treated, they have the potential to reduce mortality and morbidity, which in turn can increase labor productivity, as healthy individuals can work more efficiently and consistently.

Another service of BPJS Kesehatan that may affect its significance is the non-capitation service that ensures that special health requirements that may not be covered under the standard package are still met. This includes specialized services and treatments required by certain conditions, thus ensuring comprehensive healthcare coverage. At the same time, there are expenditures used for prevention and health promotion services oriented towards reducing the long-term burden of disease. Such services can be through the implementation of educational campaigns, the provision of vaccinations, and the implementation of other public health programs. Reducing the prevalence of diseases through the implementation of preventive measures can reduce the financial burden associated with future healthcare costs, thereby increasing economic productivity.

The various elements mentioned earlier simultaneously contribute to economic growth by ensuring that individuals have access to effective and comprehensive healthcare services, ultimately improving quality of life and labor productivity. Our findings

corroborate those of previous studies that have identified economic benefits associated with health investments. Our findings specifically corroborate the findings of previous studies such as Beylik et al (2022) who found a positive correlation between health spending and economic growth in OECD countries. Also Kamanda et al. (2022) stated that health spending is a significant driver of long-term economic growth in Sub-Saharan Africa, and emphasized the delayed but significant impact of such investments. Such research is in line with our results regarding the direct costs of health care claims which do not show a statistically significant direct impact on GDP per capita. This finding suggests that the benefits of healthcare spending may not be immediately apparent, but take time to be realized.

This delayed effect is consistent with the findings of Jagric et al. (2021), who observed that the positive effects of healthcare spending are more pronounced in the long run. It is important to note that studies employing public health insurance as a proxy for health spending are limited. In their analysis of Western Balkan countries, Qehaja et al. (2023) included a dummy variable for public health insurance and found a significant positive impact on economic growth. In his opinion, several countries that have a per capita income or standard of living that tends to be higher can also usually provide health insurance widely.

This study underscores the significance of health insurance coverage in enhancing economic performance, a perspective corroborated by our findings in Indonesia. BPJS Kesehatan, as Indonesia's public health insurance system, serves as an important social safety net through several channels, such as providing wider access to health services for all levels of society, including the most economically vulnerable groups thereby reducing or even eliminating out-of-pocket costs that are usually a big burden for low-income families. BPJS Kesehatan ensures that everyone can access the services needed to maintain their health. This prevents a drastic decline in quality of life and productivity due to untreated illnesses, which can hamper economic growth.

BPJS Kesehatan also helps reduce poverty. High health costs are often a major cause of poverty, especially when families have to sell assets or go into debt to pay for medical expenses. With BPJS, the risk of poverty due to health costs is minimized, helping to maintain household economic stability and allowing them to remain economically productive. Additional assistance for the poor is also available in the program for BPJS Kesehatan members who are classified as Contribution Assistance Recipients (PBI). This program covers the poor and disadvantaged, with contributions paid by the central

government through the APBN and local governments through APBD so that they do not need to be burdened with monthly premium payments but can take advantage of access to health as BPJS Kesehatan members.

In the long run, BPJS also plays a role in promoting economic stability by reducing the uncertainty faced by households regarding health costs. When people know they are protected from unexpected health costs, they are more likely to invest in education, training, and business ventures, all of which increase human capital and contribute to sustainable economic growth. By providing equitable health coverage, BPJS also strengthens social capital and increases people's trust in the government system. Strong social capital contributes to better social cohesion and collaboration among community members, which in turn creates a more conducive environment for economic growth.

However, it should be noted that this effect is highly dependent on how the claims are managed and the quality of health services provided. If the cost of claims is high but not accompanied by improvements in the quality of health services, then the impact on productivity and economic growth could be minimal. Higher health insurance claim costs can be interpreted as improved access to needed health services. This indicates that more sick people receive proper care and more people recover from their illnesses. This recovery not only reduces mortality, but also returns individuals to economic productivity. Individuals who have recovered can again contribute to the labor market or other economic activities, which then increases GDP per capita indirectly. In conclusion, the aggregate cost of healthcare claims, particularly through the BPJS system, has a positive and sustained impact on Indonesia's GDP per capita over time. This strengthens the necessity for sustained and comprehensive health investments to drive economic growth, in alignment with Mushkin's health-led growth hypothesis and the broader literature on the economic benefits of health expenditure. However, it is important for BPJS Kesehatan to not only expand service coverage, but also ensure that the quality of services provided is up to standards that can truly improve public health and economic productivity. BPJS as a public health insurance provider contributes significantly to improving the quality of human resources, which is the foundation of productivity and economic growth. By improving access to healthcare and ensuring that individuals can stay healthy and productive, BPJS serves not only as a social safety net, but also as a driver of long-term economic growth in Indonesia. Health spending through BPJS, if managed well, can be a powerful investment in human capital that will deliver substantial economic dividends through increased productivity, social stability, and general well-being.

4.1.2 Government Health Expenditure and Its Impact on Indonesia's Economy

This study examines the influence of government health expenditure, calculated as a proportion of total government expenditure, on gross domestic product (GDP) per capita in Indonesia. The results demonstrate that fluctuations in government health spending have no statistically significant influence on GDP per capita, whether in the short or long term. This result does not support the hypothesis that government spending on health has a positive effect on economic growth in Indonesia and also inconsistent with Mushkin's health-led growth hypothesis, which stated that investment in health promotes economic growth by increasing labor productivity. The research conducted resulted in an identification process carried out on the positive relationship between expenditure from the health sector and economic growth which contradicts each other with these findings. For example, Bedir (2016) observed a unidirectional causality between health expenditure and GDP per capita in the Philippines, and a bidirectional relationship in countries such as the Czech Republic and the Russian Federation. Wang et al. (2011) Several countries that have a high level of economic development, from middle class to high class, are experiencing economic growth driven by increased health spending in the short term.

However, our findings are more consistent with studies such as Yasikha et al. (2023), which found a positive correlation between health expenditure and GDP in Indonesia. This suggests that the relationship between these variables may be more complex than is apparent from government spending alone. One potential rationale for the lack of statistical significance observed in our findings may be attributed to the composition and the efficiency of health spending. This study has the purpose based on the rules of Domestic General Health Expenditure, which is a measurement result as part of the percentage of total expenditure from the government as a whole, may be insufficient for capturing the effectiveness and targeted impact of health spending. Prior research, including that conducted by Halici-Tullice et al. (2016), has demonstrated that public health spending positively impacts GDP in high-income countries, yet the impact may differ in low-income countries.

Furthermore, the structure of health spending in Indonesia, where the majority of funds are allocated to administrative costs and indirect health services, does not directly contribute to the improvement of individual health outcomes in the same way that clinical and preventive services do. Administrative costs comprise expenses related to the administration and operational aspects of healthcare services. These include expenditures on administrative personnel, information systems, and other overhead costs. Indirect

healthcare services encompass activities such as health system governance, policy development, and regulatory oversight. When a notable portion of health spending is allocated to administrative and indirect services, the funds available for direct clinical services and preventive services may be diminished. This can diminish the prospective beneficial impact of health spending on GDP, as the direct pathways through which health investments can enhance economic productivity—such as through a healthier and more productive workforce—are not fully optimized, which can reduce the prospective beneficial impact on GDP. Sethi et al. (2020) highlight the importance of institutional quality and efficient resource allocation in translating health spending into economic growth. In contrast, private health spending often demonstrates disparate dynamics. Halici-Tullice et al. (2016) discovered that private health spending has a detrimental effect on GDP in low-income countries, indicating that public investment in health is more effective in promoting economic growth.

There are several other possibilities that could reflect the reason why the effect of government health expenditure is not significant on economic growth. In addition to the allocation structure of government health expenditure, which tends to be heavy on administrative costs and indirect health services, the increase in spending on health may not be accompanied by efficiency and allocation of funds so that the effect may not be optimal. In this context, endogenous growth theory emphasizes the importance of human capital-including health-as a key driver of economic growth. However, if this spending is not focused on areas that actually improve the health and productivity of the workforce, then its potential impact on economic growth will not be obvious.

Another reason is that the impact of government health spending may be more long-term and not immediately apparent within the timeframe of this study. Spending on health infrastructure, such as hospital construction or health worker training, may take time before its impact on public health and economic productivity can be felt. This is in line with the Cobb-Douglas theory, where investments in physical capital (such as health infrastructure) and improvements in labor productivity take time to generate a significant impact on economic output, whereas this study only covers the last 10 years of government health spending.

Despite the time coverage issue, there are also other limitations that may not be captured in this study such as the extraordinary events when the world was hit by the 2019 Corona Virus Disease Pandemic and how the Indonesian government made special policies in the context of handling and post-covid-19 recovery. Several special steps were taken by

the Indonesian government such as stipulating Law (UU) Number 2 of 2020 concerning Stipulation of Government Regulation in Lieu of Law Number 1 of 2020 concerning State Financial Policy and Financial System Stability for Handling the 2019 Corona Virus Disease (Covid-19) Pandemic and/or in the Context of Facing Threats that Endanger the National Economy and/or Financial System Stability into Law. The law is the government's response to declining state revenues and global economic uncertainty so that the government requires extraordinary policies and measures in the field of state finances, including in the fields of taxation and regional finances, and the financial sector, which must be taken immediately in order to save health and the national economy, with a focus on health spending, social safety net, and recovery of the affected business world.

The provision of more adequate health services that can cover the community affected by Covid-19 as a whole must also be ensured by the government itself, so that the Ministry of Health, BPJS Kesehatan, Health Offices at the Provincial/District/City level, to various hospitals that have been detailed by the Decree of the Minister of Health (KMK) of the Republic of Indonesia Number HK.01/07/MENKES/446/2020 relating to Technical Instructions for Claims for Reimbursement of Service Costs for Patients with Certain Emerging Infectious Diseases for each hospital that has provided Corona Virus Disease 2019 (Covid-19) services, so that various regulations relating to the financing of patients who have been treated with Certain Emerging Infectious Diseases (PIE), especially for COVID-19 Infectious Diseases also cover various claims addressed by the Ministry of Health through the Director General of Health Services (Rokom, 2021). The insignificance may be explained by the COVID-19 pandemic event that forced the government to establish extraordinary measures in health management. In this situation, BPJS Kesehatan focuses more on the verification process of COVID-19 case claims, while pandemic-related financing is handled by the Ministry of Health (Kusila et al., 2022). This can be seen from the sharp increase in the Indonesian government's health budget ratio from 2019 to 2020 and from 2021 to 2022 (Figure 1.1). Meanwhile, the cost of health claims showed a downward trend from 2019 to 2021 (Figure 1.2), which may reflect the priority of the government budget allocated specifically for COVID-19 management. As these costs are not fully reflected in the government health expenditure data used in this study, the results may not fully illustrate the impact of government health expenditure on economic growth. This phenomenon can be discussed as a limitation of this study, given the tremendous impact of the COVID-19 pandemic on government health spending that may not be fully reflected in the data used. Alternatively, it could also be considered an outlier, given the highly unusual situation during the period.

Although our study did not identify a statistically significant relationship between government health spending and GDP per capita, this does not invalidate the potential economic benefits of health investments. This indicates the necessity for a more targeted and efficient allocation of health resources. It is the responsibility of policymakers to ensure that health spending is as effective as possible. More effective management strategies and targeted allocations are needed to maximize the positive impact of health spending on the Indonesian economy. This requires a focus on directing funds towards interventions that will improve population health and productivity. This approach is consistent with the broader evidence base that supports the economic benefits of health investments, as shown in numerous global studies.

4.1.3 Relationship between Urban Population and Consumer Price Index on Economic Growth

Urban population and the Consumer Price Index (CPI) are two important variables that significantly affect a country's economic dynamics. This study uses them as control variables in a study on health expenditure and economic growth because they affect various relevant aspects, including insurance claim costs, government health expenditure, and GDP per capita. The short-term ARDL results show that the current period coefficient of Urban Population (LN_URBAN) is positive but not statistically significant. Meanwhile, the urban population at lag 1 shows a negative and statistically significant coefficient. Meanwhile, the Consumer Price Index is highly significant in the current period (D(CPI)) and the fourth lag (D(CPI(-4)) with positive and negative coefficients. The long-run ARDL results show that both have positive coefficients with GDP per capita but are not statistically significant. Hence, in the long run, this finding is not consistent with the research hypothesis, but it is consistent in the short run.

The relationship between urban population and economic growth is complex and interrelated, consisting of many interacting factors that need to be considered. The process of urbanization is often regarded as the main accelerator of economic progress. Mainly due to the fact that one of the distinguishing features of urban areas is usually economic productivity due to economies of scale and agglomeration of economies in urban areas. As a city develops, it attracts more businesses, industries, innovation, and infrastructure, which in turn create employment opportunities and stimulate economic growth. Large urban populations tend to increase demand for public services, including health services. This can affect government budget allocations, including spending on health, as the government needs to provide adequate health infrastructure to support dense urban populations. In

urban areas, access to health facilities is better compared to rural areas. With a large urban population, more people are likely to utilize the available healthcare services, which may lead to an increase in health insurance claims. This dynamic has been extensively documented in the existing literature. For example, Rahman (2019) observed that most of the economic output comes from urban areas, thus emphasizing the important role of cities in economic development. The findings of this study support the hypothesis that an increase in urban population is associated with positive economic growth in Indonesia. Consistent with these findings, Zhang and Xie (2019) identified a short-run interactive relationship between urban expansion and economic development. The initial gains from urbanization can be attributed to economic agglomeration, which occurs when businesses and industries cluster. This allows them to share resources, infrastructure, and markets which can then lead to productivity and innovation.

However, the relationship between the two variables cannot be explained so easily. The long-term relationship between urban population growth and economic growth is more complex. The benefits of high urbanization can be reversed if rapid urbanization is not properly managed in cities, which can pose considerable challenges in the long run. Several phenomena, such as overcrowding, coupled with a lack of adequate infrastructure and rising living costs, can put considerable pressure on urban systems, and reduce quality of life, which in turn lowers economic productivity. Environmental conditions in urban areas, such as air pollution, stress, and unhealthy lifestyles, can increase the prevalence of certain diseases. This can increase the number of insurance claims, as more people need health care, so the positive or negative effect of insurance claims on economic growth can depend on the readiness of health infrastructure in urban populations or the efficiency of health spending. Large urban populations often require more complex and sophisticated health services, which can also increase government health spending. The government needs to invest in greater health infrastructure in urban areas to meet the needs of a dense population. This will increase government health spending to build hospitals, clinics, and other health services. This complexity is reflected in our study, which indicates that the effects of slow urban population growth can have a potentially negative impact on GDP per capita. Similarly, Mahalik and Mallick (2014) identify comparable outcomes, indicating that an expansion in urban population can negatively influence economic growth in specific contexts, particularly if urban growth exceeds infrastructure development.

The next control variable is the Consumer Price Index (CPI). The Consumer Price Index (CPI) is a measure of changes in the prices of goods and services over time and is

therefore an important indicator of inflation. The CPI measures the inflation rate, which directly affects people's purchasing power (Fernando, 2024). High inflation can reduce purchasing power, which can reduce consumption and depress GDP per capita. Conversely, controlled inflation can support economic growth by maintaining price stability and boosting consumer confidence. The CPI also reflects overall economic stability. Price stability is essential for maintaining sustainable economic growth. When inflation increases, healthcare costs also tend to increase, which means the number of insurance claims may also increase. Increased medical costs can lead to higher insurance claim costs because the premiums paid may not be enough to cover the increased health care costs. Insurance companies may need to adjust premiums to offset health cost inflation. This can affect the number of claims filed, as higher premiums can reduce the number of people who can afford insurance or increase the number of claims by those who are already insured. High inflation can erode the government's health budget, forcing the government to allocate more funds to maintain the quality and quantity of health services. This may lead to an increase in government health spending.

In examining this variable Index, our research found an important role for CPI in driving economic growth. In the short term, a positive trend in the CPI could potentially have a positive impact on GDP per capita. This phenomenon occurs because moderate inflation stimulates increased consumer spending and business investment, as people and firms seek to purchase goods and services before prices rise further. The phenomenon receives further support from Abdullahi (2023) who notes that CPI fluctuations can have a significant impact on economic activity by affecting incomes, salaries and retirement rates. However, this does not mean that the long-term impact will also be positive, as the long-term impact of CPI on economic growth is more complicated. The government may need to adjust their health budget every year to keep up with the rising prices of health goods and services, which will affect the total government health expenditure. While moderate inflation can have a beneficial impact, prolonged and high inflation has a detrimental impact. Some of which can erode purchasing power, create uncertainty, and ultimately adversely affect economic stability. Findings from our research suggest that while a short-term rise in the CPI can boost economic growth, the long-term impact can be adverse if inflation becomes too volatile or excessive.

The dual nature of the CPI impact has been stated by Trejo-García (2024) who found that while CPI shocks can boost short-term economic growth, their long-term impact can be destabilizing if not managed carefully. Similarly, Ayonete (2023) posits that

moderate inflation is conducive to growth, whereas high price volatility can erode economic stability. The relationship between urban population and CPI with economic growth in Indonesia suggests the need for balanced and sustainable economic policies. The urbanization process should be carefully managed to maximize its benefits and mitigate its challenges. Similarly, inflation must be managed to maintain economic stability and growth. In this study, we use these variables as controls to facilitate proper isolation of the impact of public health insurance claim costs on economic growth, thus enabling the formulation of more accurate and meaningful conclusions.

The study concludes that while urbanization generally promotes economic growth through increased productivity and economic agglomeration, it also presents challenges that require careful management. Similarly, the Consumer Price Index (CPI) affects economic growth through its impact on inflation and purchasing power, thus emphasizing the necessity for stable price levels to support sustainable economic development. The utilization of urban population and CPI as control variables in our study highlights their significant influence on the balanced and sustainable economic trajectory of Indonesia.

4.1.4 Policy Implications

Based on the findings of this study, there are several policy implications that can be taken to encourage sustainable economic growth in Indonesia through the health sector and macroeconomic management:

1. Improving Access and Efficiency of Health Insurance Claims:
   The results show that health insurance claims have a significant positive impact on economic growth, especially through increased labor productivity. Therefore, the government needs to continue improving the coverage and efficiency of BPJS Kesehatan to ensure that more people can access adequate health services. Policies that support the digitization of claims, reduction of bureaucracy, as well as improvement in the quality of health services will go a long way in this regard.
2. Reform and Efficiency of Government Health Spending:
   While government health spending does not show a significant impact on economic growth in the long run, there are opportunities to increase its impact through improved budget allocation and efficiency. Policies that prioritize investments in health infrastructure, training of medical personnel, and preventive health programs can contribute more to sustainable economic growth. The government needs to improve monitoring and evaluation of the

use of the health budget to ensure that the funds are actually used effectively and have a direct impact on improving the quality of public health.

3. Effective Management of Urbanization:
   Urbanization has great potential to drive economic growth if managed well. Policies that support the sustainable development of urban infrastructure, including transport, housing, and public services, will help maximize the benefits of urbanization and increase economic productivity.
4. Inflation Control:
   The results show that moderate inflation can boost economic growth in the short term, but needs to be controlled to ensure long-term economic stability. Therefore, monetary policy aimed at keeping inflation at a manageable level should continue to be prioritized. Bank Indonesia needs to maintain a balance between economic growth and price stability through appropriate monetary policy instruments.

By implementing these policies, Indonesia can leverage the health sector as a key driver of sustainable economic growth, while ensuring that other factors such as urbanization and inflation are also well managed. This will support the creation of more equitable economic prosperity and an overall improvement in people's quality of life.

CHAPTER 5
CONCLUSION

5.1 Summary of Findings

Using an ARDL model, this study aims to analyze the long-run as well as short-run impact of government health expenditure and public health insurance claims on economic growth in Indonesia from 2014 to 2023. Urban population and Consumer Price Index are integrated into the model as control variables. Our findings show that:

a. The lagged value of total health insurance claim costs has a significant positive impact on economic growth. There are delayed benefits in health care investment, with the path of total BPJS Kesehatan insurance claim costs in Indonesia. Policy makers need to pay attention to sustainable funding of health services so as to improve people's health and productivity.
b. Changes in domestic government health expenditure do not show a statistically significant impact on GDP per capita, either in the short or long term. The allocation and efficiency of health spending in the past decade may need to be re-evaluated to maximize economic benefits.
c. In the short term, an increase in urban population contributes positively to economic growth. Higher productivity and economic agglomeration generated by urban population can boost economic growth. In the long run, however, urbanization should be managed carefully as urban populations can adversely affect economic growth.
d. In the short term, the Consumer Price Index has a significant positive impact on economic growth. However, in the long run, the relationship between the two is more complex.

5.2 Limitations of the Study

In its research design, this study has several limitations. Firstly, the study is based on secondary data, which may have limitations in terms of accuracy and completeness. Secondly, the study period only covers 2014 to 2023, which may not fully capture long-term trends and variations in economic cycles. The limited availability of data on the amount of government spending in handling and recovering from COVID-19 also limits this study to look deeper into what happened during COVID-19. Thirdly, the analysis focuses on aggregate data, which may not capture regional disparities and local factors that affect economic growth. Fourth, the scope of variables included in the model. The model built in this study is limited to using only a few important variables, such as health claim

costs, government health expenditure, urban population, and CPI which only act as independent and control variables. This study does not consider other factors that may be relevant such as productivity, labor, technological advancement, education level, and others. However, due to the author's limited ability to manage the data, the variables used in this study only include four independent variables and one non-independent variable, limiting the analysis that could be more comprehensive by including these additional variables.

5.3 Suggestions for Future Research

The following are suggestions for researchers who want to examine health spending in an economic context based on the author's limitations:

1. Primary data collection can be considered to improve data accuracy and facilitate a better understanding of the effect of health investment, public health insurance, consumer price index and urbanization on economic growth. Primary data collection allows for deeper analysis of extraordinary events such as covid-19 treatment that are not yet available in financial reports. Researchers can also further explore different types of health expenditure to see their relationship with economic growth.
2. Further research is needed to look at disparities between regions in Indonesia to determine the influence of local factors on the relationship between health expenditure and economic growth. This can be done using case studies or comparative analysis across different provinces or cities. Future researchers can also conduct a comparison of public insurance in different countries.
3. Future researchers can build models based on existing theories by paying attention to the relationship of each variable in more detail, such as including productivity or labor variables as intervening variables, or technological progress, education levels, and international economic conditions by paying attention to the details of their interactions, so as to analyze more comprehensively the factors that drive economic growth. Exploration of more sophisticated econometric techniques is also highly recommended to account for potential non-linear relationships and structural breaks in the data, which will be very important for future research.

By providing these suggestions, it is hoped that future research can provide a more comprehensive understanding of the relationship between health expenditure, urbanization, and economic growth.

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