# The Influence of Minimum Wage, GDP Regional and Infrastructure Toward Inflation

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**Abstract**

Inflation regulation policies that are more national in nature so that they pay less attention to the causes of inflation in each region, regional inflation control needs to be carried out partially and focus on certain commodity groups because the commodities contributing to regional inflation in each region are different. The results of the partial test show that variable LNUMP (Minimum Wage) and LNPDRB (GDP Regional) has proven to significantly influence the inflation, also variable LNTJ (Infrastructure) does not significantly affect the inflation variable partially (Y). The test results show that Adj R2 is 0.216897 which means that independent variables together have a magnitude of 21% influence on the dependent variable, or variables Minimum Wage (X1), Gross Regional Domestic Product (X2) and Infrastructure (X3) have a 21% effect on the elasticity of changes in inflation (Y).

**Keywords:** Minimum Wage, GDP Regional, Infrastructure, Inflation

## 1. Introduction

### 1.1 Introduce the Problem

Price stability in Indonesia is regulated by two institutions, namely government institutions (central and regional) in fiscal terms and Bank Indonesia (BI) in monetary matters. Changes in the prices of goods and services will always occur as long as economic activity takes place, but the problem is the ability of the community to reach the prices of these goods and services in order to meet their needs.

Individuals have limitations in reaching prices, especially during the pandemic, from 2019 to 2020 there were around 30 million micro, small and medium enterprises (MSMEs) that went bankrupt and it is estimated that as many as 7 million individuals lost their jobs in the informal MSME sector. Job loss limits the amount of income generated, it is necessary to prioritize goods

needed and when the number of closed businesses increases it will affect the availability of goods needed at a certain time. Countries as individuals in the economy that experience reduced income resulting from national income need to make choices to consume or make savings and consider the availability of goods through export and import activities, each of these activities needs to be carried out by the state to maintain stability in changes in price levels.

All domestic goods and services produced from economic activities are an illustration of the Gross Domestic Product (GDP) or when the product produced is in a certain area or province, it is known as the Gross Regional Domestic Product (GDP Regional). When the available products to meet people's needs are reduced, there will be a shortage of products which causes an increase in the price of these goods.

Fulfilling the need for goods can be done through importing goods from other regions, but considering the vast territory of Indonesia, distribution activities will take into account the availability of infrastructure from producing areas to consumer areas. Distribution problems that are a factor in influencing inflation, one of which is the limitations of distribution channels, including road conditions that will affect the duration of delivery and shipping costs

*1.2 Importance of the Problem*

The formation of national inflation is an aggregate figure from regional inflation, namely taking into account inflation rates from 90 cities determined by the Statistics Indonesia (BPS) in 2020 for a survey with commodities that are considered to have different levels of price and quality of commodities. The price difference that occurs is the effect of conditions in the region, including wage levels, living costs, infrastructure conditions and transportation costs incurred as well as local taxes

Inflation regulation policies that are more national in nature so that they pay less attention to the causes of inflation in each region, regional inflation control needs to be carried out partially and focus on certain commodity groups because the commodities contributing to regional inflation in each region are different. Foodstuff commodities in the Jakarta area have the longest time to return to their natural state, commodities that have a major influence on the persistence of inflation in the South Sulawesi region, namely the housing group, water, electricity, gas and fuel. For the West Papua region, persistent inflation is influenced by the health and prepared food groups, drinks, cigarettes and tobacco while for the City of Surabaya the Health group had the highest persistence rate. (Arimurti & Trisnanto, 2011; Azwar, 2017; Azwar & Subekan, 2017; Farida et al., 2020). Inflation, which is an economic problem, can be controlled both nationally and regionally, but it is necessary to diagnose the types and factors that cause it.

The regional economy has problems that need attention, Christaller-Lösch proposed the idea "factors other than natural-resource location play an important part in explaining the spatial pattern of activities" and Lösch added the possibility of 1) the concentration of all activities in one place, 2) the spread of all activities uniformly throughout the area (perfect homogeneity), or 3) there is no systematic pattern at all or the occurrence of activities is random. Furthermore, Lösch explained that there are two constraints in regionalism, economies of spatial concentration and transport costs (Hoover and Giarratani, 2020).

*1.3 Relevant Scholarship*

Regional economics is a branch of economics that includes elements of regional potential differences in its discussion and compares one region to another. IER analyzes the region as a whole of its activities and potential and how to regulate policies to increase the region's economic growth.

The growth center theory is a theory that combines the principles of decentralization and concentration. A location with a dynamic concentration of business or industry so that it will be able to stimulate the economy in and out of the region/region. A location with facilities and ease of carrying out economic and social activities will become a center of attraction (pole of attraction). When industry (economy) is concentrated in a certain place, that area will have faster economic growth when compared to areas where industrial activities are scattered and dispersed.

The structuralist theory approach states that inflation in developing countries is more due to structural factors in the economy, this is based on experiences from countries in Latin America. Structuralists explain that there are two structural problems in developing country economies that result in inflation, namely 1) exports are not elastic. Conditions when export value growth is slower than other sectors, the slowdown in export growth will hinder the ability to import needed goods. Developing countries will carry out import substitution policies even at high costs resulting in high prices of goods (inflation). 2) Inelastic production of domestic foodstuffs. Growth in domestic food production which is not as fast as population growth and per capita income will cause food prices to tend to increase higher than other goods. This condition will lead to a demand for an increase in wages from workers to meet needs, the next condition that will occur is an increase in production costs which will eventually lead to an increase in the price of goods (inflation).

Factors causing inflation can be caused from the demand side, supply side and expectations. Demand-pull inflation is inflation resulting from long-term supply and demand interactions. Inflationary pressure from the demand side will arise if AD (aggregate demand) differs from AS (aggregate supply). Aggregate demand (AD) is the total demand for goods and services in an economy for consumption and investment purposes. The total goods and services consumed and invested is referred to as the Gross Domestic Product (GDP) of the economy. Meanwhile, aggregate supply (AS) is all the potential of an economy to be able to meet aggregate demand. The difference between aggregate demand and supply is known as the output gap, a condition where AD > AS will put greater pressure on inflation and vice versa. If seen based on this explanation, the output gap can be used as an indicator of whether there is pressure on the inflation rate or not, but it should be noted that the output gap which can be used as an indicator when economic conditions are normal, the output gap in economic conditions after a crisis or in stagnant economic conditions accompanied by inflation (stagflation) is not appropriate to be used as an indicator.
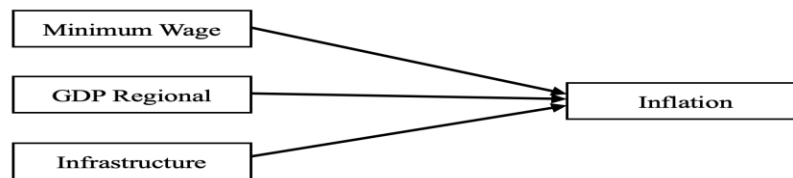
*1.4 Research Design*



Figure 1. Research Design

Hypothesis:

1. Minimum Wage has a significant effect on regional inflation in Indonesia during 2009 – 2020
2. GDP Regional has a significant effect on regional inflation in Indonesia during 2009 – 2020
3. Infrastructure has a significant effect on regional inflation in Indonesia during 2009 – 2020

## 2. Method

*2.1 Sampling Procedures*

Sampling in this research used a purposive sampling approach. The data used as samples had the following criteria:

a. Provinces that are in the territory of Indonesia
b. Provinces that have gross regional domestic product data for 2009 – 2020 period
c. Provinces that have provincial minimum wage data for 2009-2020 periode
d. Provinces that have Infrastructure data for 2009-2020 period
e. Provinces that have inflation data for 2009 – 2020 period

Table 1. Sample Size

| Province | Year | $X_1$ (Minimum Wage) | $X_2$ (GDP Regional) | $X_3$ (Infrastructure) | Y (Inflation) |
|---|---|---|---|---|---|
| Aceh | 2009 (1) | $\ln(X_1)_{i,\,2009}$ | $\ln(X_2)_{i,\,2009}$ | $\ln(X_3)_{i,\,2009}$ | $(Y)_{i,2009}$ |
| | … | … | … | … | … |
| Aceh | 2020 (12) | $\ln(X_1)_{i,\,2020}$ | $\ln(X_2)_{i,\,2020}$ | $\ln(X_3)_{i,\,2020}$ | $(Y)_{i,2020}$ |
| … | | | | | |
| Papua | 2009 (1) | $\ln(X_1)_{i,\,2009}$ | $\ln(X_2)_{i,\,2009}$ | $\ln(X_3)_{i,\,2009}$ | $(Y)_{i,2009}$ |
| | … | … | … | … | … |
| Papua | 2020 (12) | $\ln(X_1)_{i,\,2020}$ | $\ln(X_2)_{i,\,2020}$ | $\ln(X_3)_{i,\,2020}$ | $(Y)_{i,2020}$ |

*2.2 Measures and Analysis*

Time series secondary data processing from 34 provinces in Indonesia is quantitative with a ratio scale. Sources of research data come from the national and provincial statistical center (BPS), national and provincial Bank Indonesia (BI), the Ministry of Public Works and Public Housing (PUPR), as well as other institutions relevant to research. Data analysis use Panel analysis.

Panel data analysis has three model approaches that are applied, namely Pooled Least Square (PLS), Fixed Effect Model (FEM) and Random Effect Model (REM). The principle used in the Pooled Least Square (PLS) approach is a combination of all data (pooled), namely $N \times T$ observations, where N is the number of unit cross-sections and T is the number of time-series. The Fixed effect model (FEM) approach incorporates dummy variables so that the intercept $\alpha$ varies between individuals and between time units. FEM is more appropriate to use when research data is at the individual level and if there is a correlation between $\varepsilon_{it}$ and $x_{it}$. The Random Effect Model (REM) approach is used when the individual and regressor assumptions do not have a correlation, this makes the error component of the individual effects included in the error in the regression equation. Another assumption that needs to be considered is that individual errors and combined errors are not mutually correlated. Selection between pooled least squares models. fixed effects and random effects are carried out through 2 stages, there is Chow test and Hausman test.

## 3. Results

The results of the test that has been carried out with the dependent variable (Y) is Inflation (LNINF_2) while the independent variable is $X_1$ is Minimum Wage (lnUMP), $X_2$ is the Gross Regional Domestic Product (GDP Regional) (lnPDRB) and $X_3$ is Infrastructure (lnTJ).

*3.1 Statistics and Data Analysis*

The results of the partial test show at the probability value of the t-statistic, the significance level used is 5% or 0.05. Prob results (t-statistic) <0.05 proves that there is a partially significant effect between the independent variables on the dependent variable. When the Prob(t-statistic) > 0.05 proves the effect is not significant partially.

The results (table 2) show that the prob(t-statistic) rate is 0.0000 <0.05, which means that the independent variable LNUMP (Minimum Wage), is proven to significantly influence the inflation variable partially (Y). The results showed that the independent variable LNPDRB (GDP Regional) has a prob(t-statistic) rate of 0.0000 <0.05, which means that the independent variable LNPDRB (GDP Regional) is proven to significantly influence the inflation variable partially (Y). The results also show that the independent variable LNTJ (Infrastructure) has a prob(t-statistic) value of 0.2727>0.05, which means that the independent variable LNTJ (Infrastructure) does not significantly affect the inflation variable partially (Y).

The test results (table 2) show that the value of $R^2$ is 0.286164 and the value of Adj $R^2$ is 0.216897 which means that independent variables together have a magnitude of 21% influence on the dependent variable, or variables Minimum Wage ($X_1$), Gross Regional Domestic Product ($X_2$) and Infrastructure ($X_3$) have a 21% effect on the elasticity of changes in inflation (Y).

Table 2. Panel Result – FEM approach

Dependent Variable: LNINF_2
Method: Panel Least Squares
Sample: 2009 2020
Periods included: 12
Cross-sections included: 34
Total panel (balanced) observations: 408

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LNUMP | -2.259551 | 0.212458 | -10.63528 | 0.0000 |
| LNPDRB | 0.847800 | 0.172569 | 4.912831 | 0.0000 |
| LNTJ | -0.221451 | 0.201579 | -1.098581 | 0.2727 |
| C | 26.37210 | 2.498771 | 10.55403 | 0.0000 |

Effects Specification

Cross-section fixed (dummy variables)

| R-squared | 0.286164 | Mean dependent var | 2.584657 |
|---|---|---|---|
| Adjusted R-squared | 0.216897 | S.D. dependent var | 1.476401 |
| S.E. of regression | 1.306513 | Akaike info criterion | 3.458908 |
| Sum squared resid | 633.2884 | Schwarz criterion | 3.822675 |
| Log likelihood | -668.6173 | Hannan-Quinn criter. | 3.602852 |
| F-statistic | 4.131316 | Durbin-Watson stat | 1.841699 |
| Prob(F-statistic) | 0.000000 | | |

The results of the FEM test produce the model equation is:

$$INF_{it} = 26{,}37210 - 2.259551\, UMP_{it} + 0.847800\, PDRB_{it} - 0.221451\, TJ_{it} + \varepsilon_{it}$$

## 4. Discussion

The level and rate of inflation in each region is influenced by the cultural and geographical characteristics of the region. Policies implemented and geographical or spatial proximity can cause the transfer of resources, knowledge and information. Indonesia is an archipelagic country where there are very real differences in terms of geographical or spatial conditions. The spatial economic perspective places the geographical location of an area as a differentiator in terms of resources owned, commodities consumed and their quality and price levels in society, these things are the cause of different inflation rates so that a different control process is needed.

Regional economic development planning will be related to the central government, so it is necessary to pay attention to several elements in it (Kuncoro and Safi'i. 2007), including:

a. National policies may not necessarily be effective for the regions and conversely regional policies may not necessarily be effective on a national scale.

b. The institutional apparatus in the regions is different from the central apparatus, the limited decision making and authority are very different between the regions and the center.

c. Regional economic development planning needs to be realistic in understanding the relationship between the center and the regions as part of the nation.

The infrastructure factor has been shown to have no effect on inflation, this can be said because infrastructure is one of the non-monetary factors from the supply side. Control from this side is less of a concern considering that the distribution centers of goods and services are mostly located in the western part of Indonesia with integrated road infrastructure compared to the central and eastern regions. The level of supply that is not evenly distributed due to road infrastructure constraints will result in prices being different in each region coupled with increasing costs following distribution costs.

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