Impact of Minimum Wage and Sectoral Growth on Inflation

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Article Information

Abstract

Inflation is one of the macroeconomic problems faced by every country. Inflation reduces the purchasing power of money. Inflation occurs due to cost-push inflation, demand-pull inflation, and rising expectations. The main objectives of this study are to analyze the impact of the minimum wage on inflation, evaluate the effect of agricultural sector growth on inflation, examine the impact of industrial sector growth on inflation, and identify the impact of service sector growth on inflation. In order to attain these goals, an examination was conducted utilizing Eviews with panel data spanning from 2013 to 2022 across 38 regions in East Java. After conducting tests on different models, it has been determined that the REM model is the most optimal. Analyzing the results obtained through the REM model reveals that the impact of minimum wage on inflation is positive but not statistically significant. The growth of the agricultural sector has a positive and significant effect on inflation. The growth of the industrial sector has a positive and insignificant effect on inflation. Growth in the service sector has a positive and significant effect on inflation.
INTRODUCTION

Inflation is one of the macroeconomic problems that occur in all countries, where each country experiences different levels. When talking about inflation, it is important to know that it is closely related to the general increase in prices of goods and services. Inflation means a decline in the value of the domestic currency, reducing the purchasing power of money. For people on a fixed income, inflation will reduce the purchasing power of their income (Dervishi, 2023). People with low fixed incomes feel inflation pressure because most of their income is used to buy consumer goods. If they buy goods and services whose prices rise, they will get fewer goods and services for their income.

The inflation rate can be calculated from changes in the consumer price index, but not all regions have a consumer price index calculation. Another method for calculating the inflation rate is determining the difference in the implicit index. Table 1 shows the implicit index and its changes during the 2017-2021 period in East Java.

Table 1. Implicit index and its changes in East Java (2017-2022)

<table>
<thead>
<tr>
<th>Year</th>
<th>Implicit Index</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>135.80</td>
<td>2.85</td>
</tr>
<tr>
<td>2018</td>
<td>140.00</td>
<td>3.09</td>
</tr>
<tr>
<td>2019</td>
<td>142.16</td>
<td>1.55</td>
</tr>
<tr>
<td>2020</td>
<td>142.71</td>
<td>0.38</td>
</tr>
<tr>
<td>2021</td>
<td>147.05</td>
<td>3.04</td>
</tr>
<tr>
<td>2022</td>
<td>155.36</td>
<td>5.65</td>
</tr>
</tbody>
</table>

Source: Central Bureau of Statistics, 2023

Based on Table 1, over the period 2017-2022, the implicit index increased every year, indicating a general price increase, as seen in the change column. This also means that inflation has occurred. In 2018, there was an inflation of 3.09%, higher than in 2017; in 2019, inflation was reduced to 1.55%; in 2020, despite the COVID-19 pandemic, inflation was reduced to 0.38%. Then, in 2021, inflation will increase to 3.04%, almost the same as the inflation rate in 2018. Then, in 2022, there will be a high increase in inflation, and inflation in 2022 will be the highest inflation during the 2017-2022 period. In daily, COVID-19 has contributed to lowering Indonesia's inflation rate (Rahmayani et al., 2021).

Many factors caused inflation. The minimum wage contributes to the production cost of goods and services. If there is an increase in the minimum wage, the cost of production will also increase. Entrepreneurs always want to maintain the level of profit they get. Therefore, with increased production costs, the price of goods will also increase. Hence, when the minimum wage rises, it tends to improve the overall price level, commonly called cost-push inflation.

Brouillette et al. (2017) researched the correlation between the minimum wage and discovered a noteworthy finding. According to their study, an elevation in the minimum wage results in a corresponding rise in inflation, indicating a positive and significant relationship between the two factors. Ma (2018) stated that the minimum wage and inflation are positively related and very strong. The relationship between the minimum wage and inflation in Indonesia, where the minimum wage increases annually, has been examined by Suparta et al. (2021). Their study suggests a spiral relationship between the minimum wage and inflation, indicating that they mutually influence each other without a definite limit. Surprisingly, Suparta et al. (2021) found that the minimum wage has a negative and significant impact on inflation, which means that an increase in the minimum wage causes a decrease in inflation.

On the other hand, Nguyen (2011) researched the same topic and arrived at a different conclusion. Nguyen (2011) found that the minimum wage has a negative effect on inflation, but the impact is not statistically significant. In other words, according to Nguyen's findings, an increase in the minimum wage does not significantly impact inflation. Meanwhile, research in Mexico conducted by Campos-Vazquez and Esquivel (2020) found that minimum wage increases have limited or even zero effect on prices.
Another factor that can cause inflation is the availability of goods and services. If the number of goods available is small, while those who ask for it remain or even increase, then the price of the goods increases. The availability of goods and services is closely related to the number of goods and services produced by all sectors of the economy (business fields) in an economy. The amount of goods and services produced by the economic sector can be seen from the added value generated by each financial sector every year based on the price constant.

The amount of goods and services produced in an economy will form Gross Domestic Product (GDP). The development of economic sectors in that country greatly influences economic growth (GDP). According to Foerster et al. (2019), the GDP growth rate has decreased by approximately 2.3 percentage points, reaching 1.7% since 1950. This deceleration in growth can be attributed to different economic sectors, with each sector being influenced differently by the evolving technological and labour force expansion trends. The impact of these sectors on overall growth is contingent upon the extent to which their changes spill over into other sectors, magnifying their effects.

The relationship between the economic sector and inflation has been studied by Olatunji et al. (2012), who found that the agricultural sector positively and significantly affects inflation. Mkhatshwa, Tijani and Masuku (2015) found that the agricultural sector had a positive and insignificant impact on inflation. This means that the higher growth of the agricultural sector will increase inflation. However, in most countries, the tendency of the development of the agricultural sector is decreasing from year to year, so it has an impact on reducing inflation.

In a study conducted by Mekonen in 2020, it was found that agricultural growth is negatively and significantly associated with inflation. As a result, inflation is detrimental to the development of the agricultural sector rather than serving as a stimulus.

Research by Sisay et al. (2022) aims to examine the effects of agriculture, service, and industrial sectors on inflation rates. The results of his research found that the agricultural sector and the service sector had a negative and significant effect on inflation. In contrast, the industrial sector positively and insignificantly affected inflation.

In this study, the economic sector was divided into three groups, namely the agricultural sector, the industrial sector, and the service sector. There are still very few studies related to the influence of the agricultural, industrial and service sectors on inflation that researchers can find.

The International Labor Organization defines minimum wage as the minimum amount of remuneration an employer must pay wage earners for the work performed during a given period, which cannot be reduced by a collective agreement or an individual contract (ILO, 2020a). In practice, the minimum wage amount may differ between countries, depending on the political climate and the competitiveness of enterprises whose workers receive the minimum wage (Wascher, 2015).

According to Permenaker Number 18 of 2022, the minimum wage is the lowest monthly wage set by the Governor as a safety net (Ministry of Manpower of the Republic of Indonesia, 2022). Within the region's scope, the minimum wage is a wage set by local governments whose amount may vary between regions and change from time to time to meet the minimum living needs of contract workers. The government establishes minimum wage standards to safeguard workers against unreasonably low wages. They help ensure a fair and equitable share of the progress outcomes for all and the minimum wage for all who work and need those protections.

Economic sectors are segments of the economy in which companies engage in similar or related business activities, offering comparable products or services. These sectors include significant businesses engaged in the same endeavour, such as natural resource extraction industries and agriculture (Kenton, 2022).
Sectoral growth is the growth of value added in each economic sector. In Indonesia, nationally and regionally, there are 17 economic sectors, and from each economic sector, there are economic sub-sectors. Each economic sector's growth is shaped by the growth that occurs in its sub-sectors.

The agricultural sector’s contribution has decreased from year to year according to Lewis’ Theory with the Lewis two-sector model in Jhingan (2012), that the process of economic transformation is well underway so that the manufacturing sector's contribution to national income eventually exceeds that of the agricultural sector. The surplus of labour in the traditional agricultural sector in the countryside is transferred to the modern industrial sector in the city, whose growth absorbs the surplus of labour, encouraging industrialization.

Chenery in Todaro & Smith (2015) argues that there is a process of transformation from the agricultural sector to the industrial sector and the service sector. Developing countries no longer focus on the agricultural sector to boost economic growth but are turning to the industrial and service sectors. In the regional scope, the agricultural sector's contribution to the declining Gross Regional Domestic Product (GRDP) does not mean that the added value created by the agricultural sector has experienced a decline but continues to increase. However, the growth of the agricultural sector slowed down.

In contrast, the growth of the industrial and service sectors resulted in the contribution of the agriculture sector to the Gross Regional Domestic Product (GRDP) decrease. If a sector's growth lags behind that of the economy, its contribution to the Gross Regional Domestic Product (GRDP) will be smaller. Conversely, if a sector's growth surpasses that of the economy, its contribution to the GRDP will be even more substantial.

Inflation can be described as the overall and consistent rise in the prices of goods and services over a specific duration. On the other hand, deflation refers to the contrary of inflation, which involves a continuous and general decrease in the prices of goods (Bank Indonesia, 2020). The Central Statistics Agency (BPS) is responsible for computing inflation. It is important to note that a rise in the price of a single item or a few goods cannot be classified as inflation unless it leads to a corresponding increase in the price of other items.

Inflation can arise from various sources, namely the supply side (cost-push inflation), the demand side (demand-pull inflation), and inflation expectations (Bank Indonesia, 2020). Cost-push inflation can occur due to factors such as the depreciation of the exchange rate, the influence of foreign inflation, particularly in trading partner countries, increases in government-regulated commodity prices (administered prices), adverse supply shocks resulting from natural disasters, and distribution disruptions.

Based on the description above, inflation is defined as a sustained increase in the general prices of goods and services (Central Statistics Agency, 2020). As elaborated by Welch and Welch (2010), inflation results from a combination of factors, including those driven by increased demand and those driven by rising production costs.

Demand-pull inflation can occur when there is a significant increase in the demand for goods and services compared to their availability. This macroeconomic situation is characterized by aggregate demand surpassing aggregate supply. Demand-pull inflation has various underlying causes, which include a growing economy, an expanding economy, rising export demand, increased government expenditures, inflation expectations, and an augmented money supply within the system (Chen, 2023). Inflation anticipations can be influenced by the sentiments and behaviours of the general populace and economic participants who consider inflation expectations when making decisions concerning economic activities.

The characteristics of inflation, which are more influenced by administered prices and supply sides, are not sufficiently overcome by monetary policy but with a harmonious relationship between monetary policy, fiscal policy, and sectoral and regional policy. TPID
was formed to be able to achieve low inflation in each region.

Based on the information provided, the objective of this study is indeed to investigate the effects of minimum wages on inflation, analyze the influence of growth in the agricultural sector on inflation, examine the impact of growth in the industrial sector on inflation, and analyze the consequences of growth in the service sector on inflation. The study aims to explore and understand the relationships between these factors and their effects on inflation.

**RESEARCH METHODS**

This study used secondary data based on panel data from 38 regions from 2013-2022. The collected includes the minimum wage, an implicit index for calculating inflation, and the added value of 17 sectors of the economy. The panel's data was obtained from the Central Bureau of Statistics.

The minimum wage in this study is the rate of increase in the minimum wage as measured by per cent. The minimum wage shows the minimum wage received by workers. The economic sector in this study is value-added growth in three groups of economic sectors in 38 regions in the province of East Java. The value-added development of the economic sector is measured by per cent. The economic sector is grouped into the agricultural, industrial, and service sectors. Inflation, which refers to the rise in prices of goods and services in terms of production, can be determined by calculating the annual changes in implicit index across 38 regions using a percentage measurement.

The conceptual framework guides researchers in analyzing the data and examining the relationships between variables. In this study, the conceptual framework is illustrated in Figure 1 below:

![Figure 1. The Conceptual Framework](image)

Source: Author illustration, 2023

Based on Figure 1, a comprehensive analysis was conducted to examine the relationships between different variables and their impact on inflation (INF). In this analysis, inflation serves as the dependent variable. At the same time, the minimum wage (MW), agricultural sector growth (ASG), industrial sector growth (ISG), and service sector growth (SSG) are considered independent variables. The analysis aims to investigate how changes in the independent variables, namely the minimum wage, agricultural sector growth, industrial sector growth, and service sector growth, influence the dependent variable, inflation.

This conceptual framework is analyzed using Eviews. In this analysis, the best model will be selected. Therefore, a model selection test is carried out to get the best model from three models (Common Effect Model, Fixed Effect Model, and Random Effect Model). Based on the results of the model selection, the regression equation can be made as follows:

\[
INF = C(1) + C(2)\times MW + C(3)\times ASG + C(4)\times ISG + C(5)\times SSG + e \quad (1)
\]

Where, INF is inflation, MW is minimum wages rate, ASG is agricultural sector growth, ISG is industrial sector growth, SSG is service sector growth, e is error term.
RESULTS AND DISCUSSION

To select the most appropriate model, such as the Common Effect Model (CEM), Fixed Effect Model (FEM), or Random Effect Model (REM) is necessary to test the model selection first.

Table 2. Redundant Fixed Effects Tests

<table>
<thead>
<tr>
<th>Effects Test</th>
<th>Statistic</th>
<th>d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section F</td>
<td>0.308772</td>
<td>(37,338)</td>
<td>1.0000</td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>12.631882</td>
<td>37</td>
<td>0.9999</td>
</tr>
</tbody>
</table>

Source: Data Processed, 2023

Chow tests or Redundant Fixed Effects Tests are used to choose between Common Effect Model (CEM) and Fixed Effect Model (FEM). Based on the Chow Test in Table 2, the Common Effect Model (CEM) was chosen because the probability of Cross-section F was 1.0000 > 0.05, then continued by conducting the Lagrange Multiplier test, as seen in Table 3.

Table 3. Lagrange Multiplier (LM) Test

<table>
<thead>
<tr>
<th>Null (no rand. effect)</th>
<th>Cross-section</th>
<th>Period</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breusch-Pagan</td>
<td>9.667780</td>
<td>1195.472</td>
<td>1205.140</td>
</tr>
</tbody>
</table>

(0.0019) (0.0000) (0.0000)

Source: Data Processed, 2023

The Lagrange Multiplier Test (LM) or Lagrange Multiplier Tests for Random Effects are used to choose between the Common Effect Model (CEM) and the Random Effect Model (REM). Based on the Lagrange Multiplier (LM) Test in Table 3, a Random Effect Model (REM) was chosen because the probability of Both from Breusch-Pagan is 0.0000 < 0.05.

Based on the model selection test results, the Random Effect Model (REM) is the best model chosen. The results of the regression coefficient estimation are shown in Table 4.

Table 4. Regression Coefficient Estimation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>SE</th>
<th>t-Stat</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.7079</td>
<td>0.1895</td>
<td>9.01</td>
<td>0.00</td>
</tr>
<tr>
<td>MW</td>
<td>0.0064</td>
<td>0.0124</td>
<td>0.52</td>
<td>0.60</td>
</tr>
<tr>
<td>ASG</td>
<td>0.2452</td>
<td>0.0385</td>
<td>6.36</td>
<td>0.00</td>
</tr>
<tr>
<td>ISG</td>
<td>0.0109</td>
<td>0.0376</td>
<td>0.29</td>
<td>0.77</td>
</tr>
<tr>
<td>SSG</td>
<td>0.2189</td>
<td>0.0444</td>
<td>4.93</td>
<td>0.00</td>
</tr>
</tbody>
</table>

R-squared 0.2905

Adjusted R-squared 0.2829

F-statistic 38.3888

Prob(F-statistic) 0.0000

Source: Data Processed, 2023

Based on the analysis presented in Table 4, it is possible to formulate the regression equation as follows:

\[
\text{INF} = 1.7079 + 0.0065*\text{MW} + 0.2452*\text{ASG} + 0.0109*\text{ISG} + 0.2189*\text{SSG} + e \quad \ldots \ldots \quad (2)
\]

The coefficient of regression of agricultural sector growth (ASG) with a positive sign means that the influence of agricultural sector growth on inflation is positive or unidirectional. The development of the agricultural sector in East Java tends to decline. Therefore, the decline in the growth of the agricultural sector is also followed by a decrease in inflation. Population growth increases demand for agricultural products, increasing prices and contributing to inflation. Another contributing factor is the restriction on importing agricultural products, such as soybeans, causing the supply of agricultural products in Indonesia,
especially in East Java, to be insufficient for the people's needs. Thus, there is an increase in prices or inflation.

The positively marked industrial sector growth regression coefficient (ISG) means that the effect of sector growth on inflation is positive or unidirectional. The development of the industrial sector in East Java tends to decrease. Therefore, the decrease in growth of the industrial sector is also followed by a reduction in inflation.

A positively marked service sector growth regression coefficient (SSG) means that the effect of service sector growth on inflation is positive or unidirectional. The development of the service sector in East Java tends to decline. Therefore, the decline in service sector growth is also followed by a decrease in inflation.

Based on the results of the analysis in Table 4, the coefficient of determination (Adjusted R-squared) is 0.2829, which means that the minimum wage, agricultural sector growth, industrial sector growth, and service sector growth simultaneously affect inflation by 28.29%, while variables outside the model used influence the rest of 71.71%. Minimum wages and sectoral growth influence inflation and can be affected by increases in the money supply, government employees' salaries, and so on. During the COVID-19 pandemic, government employees had no minimum wage or salary increase. It is proven that the influence of variables outside the model is significant, which is indicated by the probability of constant (C) of 0.0000.

Simultaneously, the impact of the minimum wage, agricultural sector growth, industrial sector growth, and service sector growth on inflation can be evaluated using the F-test. In this case, the F-count value is 38.39 at a probability level of 0.0000, which is less than the significance level of 0.05. This implies that all the mentioned factors, namely the minimum wage, agricultural sector growth, industrial sector growth, and service sector growth, jointly have a statistically significant effect on inflation.

Partially, the analysis reveals that the impact of the minimum wage on inflation is positive, but the associated probability value of 0.6035 is greater than the significance level of 0.05. The observed effect of the minimum wage on inflation is not statistically significant, meaning that the influence of the minimum wage on inflation is positive but considered insignificant. The decrease in the minimum wage tends to reduce inflation. The results of this study support the results of previous research conducted by Brouillette et al. (2017), which suggested that an increase in the minimum wage can contribute to higher inflation rates. However, it is essential to note that the results of this study contradict the research conducted by Suparta et al. (2021). In Suparta et al. (2021) research, the independent variable is only the minimum wage. In this study, three independent variables were added so that the number became four variables independent, but the effect of the minimum wage on inflation is positive and insignificant.

A lower rate of increase in the minimum wage can potentially contribute to a decrease in inflation. When the minimum wage increases slowly, it may mitigate the upward pressure on prices for goods and services. While reducing the minimum wage could lead to higher prices, the rate of price increase, or inflation, may decrease. The increase in the minimum wage can result in cost-push inflation, where businesses facing higher labour costs pass on those costs to consumers by raising the prices of their products or services. However, when the increase in the minimum wage is lower, it may alleviate some of the inflationary pressures associated with increased labour costs, but not too big, which is indicated by the positive effect of the minimum wage on inflation.

When the minimum wage experienced by workers rises at a higher rate, it leads to an increase in their morale, subsequently boosting the production of goods and services. As a result, the supply of goods and services also expands, and both the demand side of goods and services and population growth experience an increase due to the higher minimum wage. That increased demand can initially lead to higher prices for
goods and services, resulting in demand-pull inflation. However, it is possible for the inflation rate to subsequently slow down or even decline over time.

The analysis indicates that the effect of agricultural sector growth on inflation is positive, and the associated probability value of 0.000 is less than the significance level of 0.05. This indicates that the observed effect of agricultural sector growth on inflation is statistically significant. Therefore, it can be concluded that there is a positive and significant impact of the development of the agricultural sector on inflation.

Although the growth of the agricultural sector continues to decline, rural areas continue to receive social security such as direct cash assistance (BLT) or other social security programs. The agricultural sector, if not supported by the government, will cause its distribution of GRDP to decline. Social policies are rolled out to villages where each receives Rp 1 billion in government assistance as a social safety net.

This decrease in growth in the agricultural sector increases the value added produced in the agricultural sector, so the increased supply of products from the agricultural sector can increase prices for an increasing population. The rate of price increase is decreasing, leading to a decrease in the inflation rate.

The analysis suggests that the effect of industrial sector growth on inflation is positive. However, the associated probability value of 0.7724 is greater than the significance level of 0.05. This implies that the observed effect of industrial sector growth on inflation is not statistically significant. Therefore, it can be concluded that industrial sector growth has a positive but insignificant impact on inflation. The growth of the industrial sector group has decreased, but was able to reduce the increase in the price of goods and services so that it did not cause a significant increase in prices. Thus, the growth of the industrial sector does not cause significant inflation.

Several regions in East Java are relocation destinations for labour-intensive industries, such as Lamongan Regency and Tuban Regency, which is in range 2, experiencing growth in industrial sector groups. In addition to the areas in range 2, the areas in range 3 are also destinations for the relocation of labour-intensive industries, such as Nganjuk Regency, Kediri Regency, Ngawi Regency, Magetan Regency also experienced growth in the industrial sector group.

The analysis indicates that the effect of service sector growth on inflation is positive, and the associated probability value of 0.000 is less than the significance level of 0.05. This suggests a statistically significant positive effect of the growth of the service sector on inflation. In other words, the growth of the service sector has a significant and positive impact on inflation. The results of this study reject the results of research conducted by Sisay et al. (2022), which states that the service sector has a negative and insignificant effect on inflation. The annual decline in the service sector's expansion, particularly in certain urban and industrial regions, has resulted in a notable reduction in inflation.

The growth of service sector segments, fueled by the information and communication sector, is prompted by the emergence of the digital economy system, necessitating the presence of this secretariat. For instance, activities like e-commerce and social media, closely tied to internet usage or the advancement of the fourth industrial revolution, benefit from its existence.

**CONCLUSION**

Based on the results of the analysis using the Random Effect Model (REM), it was found that the increase in the minimum wage caused an insignificant increase in inflation. The minimum wage has a positive and insignificant effect on inflation.

The growth of the agricultural sector, which tends to decline yearly, causes a significant decline in inflation. The agricultural sector has a positive and significant effect on inflation.

The growth of the industrial sector, especially in several industrial areas, tends to decline yearly, causing a significant decline in
inflation. The industrial sector has a positive and insignificant effect on inflation.

The annual decline in the service sector's expansion, particularly in select urban and industrial regions, has substantially reduced inflation. This decline in the service sector has a noteworthy and positive impact on inflation.

REFERENCES


