PROJECTION ANALYSIS OF ECONOMIC DEVELOPMENT IN INDONESIA IN THE PERSPECTIVE OF ISLAMIC ECONOMY USING THE VECM MODEL

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Abstract

The purpose of this research is to analyze how inflation, unemployment, and government expenditure affect economic growth in Indonesia in the 2000-2022 period. To project the economy in Indonesia in the short term (next 10 years) and in the long term (next 20 years). This type of research uses quantitative methods. The data used are secondary data sourced from the official website of SEKI-BI, the Central Bureau of Statistics, the World Bank, and SIMREG (Regional Basic Data Management and Information System) from 1990 to 2022 so that the number of samples in this study was 128 samples using a purposive sampling technique to determine information. While technical data analysis uses Vector Autoregressive Analysis (VAR) and Vector Error Correction Model (VECM). Based on the results of the Impulse Response Function, we can see that the shock resulted from the previous period's GDP, the GDP Deflator, TPT and GE were very volatile and unstable in the short term, the biggest shock was found in the early period of year 1 to year 20, then the shock subsides from the mid to late period (25th year to 50th year), in the final period the shocks are still starting to stabilize.

Keywords: Inflation, Unemployment, Government Expenditure, VAR, VECM
INTRODUCTION

Economic conditions are often an indicator of the quality of a country. National income and economic growth can be indicators of economic conditions. Economic growth reflects economic activity. The achievement of economic growth rates as planned or estimated, the success of reducing the unemployment rate, and the creation of stabilization of inflation is a measure of the success of policies in the economy (Pujoalwanto, 2014). The objectives of Islamic economics according to Suprayitno (2005), include maintaining economic stability and growth and increasing economic welfare. Economic stability within the Islamic framework refers to achieving price stability and the absence of unemployment. The achievement of these objectives will make a major contribution to economic growth and will ultimately increase economic welfare. And to make it happen, of course, government policy is needed, both fiscal and monetary.

Economic growth or Gross Domestic Product (GDP) itself is influenced by several components including Consumption (C), Investment (I), Government Spending (G), Exports (E), and Imports (M) (Gilarso, 2004). Therefore, one of the reasons for increasing GDP in a country is investment. The GDP measures the flow of money in the economy (Herlambang, et al., 2001). Besides that, Economic growth requires an increase in the quality and quantity of production in economic activity, as well as an increase in capital and labor (Marthon, 2007). However, according to Aedy (2011), economic growth must be accompanied by fair and equitable distribution. If not, it will lead to economic disparities. Meanwhile, development in Islam with economic growth has a further goal in the form of increasing the welfare of the world and the hereafter. Don’t just look at material values. However, it also considers Islamic principles. According to the Central Bureau of Statistics (2018), quarterly GDP growth developments y-on-y in the 2014-2017 period showed a downward trend. This is due to the global economic conditions that have not yet recovered. Where in 2014 to 2015 it showed a decrease of 0.13% from 5.01% to 4.88%. In the following year, in 2016 it grew 5.03%, an increase from the previous year. Then the following year it grew 5.07%, only an increase of 0.04% from the previous year. In 2018...
GDP grew by an increase of 5.17%, an increase of 0.1% from the previous year. In 2020 economic growth declined sharply to minus, this was due to the covid-19 outbreak which required the government to limit people’s mobility. This has an impact on various sectors of the economy. Production delays have resulted in increased unemployment and a decrease in people’s incomes 03% increase from the previous year. Then the following year it grew 5.07%, only an increase of 0.04% from the previous year. In 2018 GDP grew by an increase of 5.17%, an increase of 0.1% from the previous year.

As a whole, in 2021, global economic recovery will continue, albeit unevenly, with continuing financial market uncertainty. Economic recovery in the AEs, especially the US, is progressing more quickly, supported by accelerated vaccination and massive fiscal and monetary policy stimulus. While on the other hand, most of the EMDEs, except for China, still have to struggle to improve their domestic economic conditions toward economic recovery. Apart from the limited supply and capacity for vaccination, the limited ability for fiscal and monetary stimulus has also resulted in a slower process of economic recovery in most EMDEs. Overall, the world economy is predicted to grow by around 5.7% in 2021 and 4.4% in 2022, after a contraction of 3.1% in 2020. Meanwhile, Global financial market uncertainty continues to persist in line with emerging risks, among others related to the increasing spread of the Delta variant Covid-19, market anticipation of the Fed’s tapering policy, as well as fears of inflationary pressures lasting longer due to supply chain disruptions and energy constraints. In addition, the increase in the spread of the Omicron variant, which has an impact on increasing uncertainty, needs to be monitored and watched out for (BI: 2022).

Based on the forecast results regarding economic growth made by Izzah (2021), it was found that in the second quarter of 2020, Indonesia experienced a decline in economic growth until the second quarter of 2023 as a result of the co-19 outbreak. This resulted in a decline in economic performance. Therefore, it is conveyed in this research that there is a need for policies that promote economic recovery. This policy must support the improvement of the health system to reduce the impact of the Covid-19 pandemic on
community activities and work. Long-term impacts can be reduced by improving governance, a more investor-friendly business environment, and increasing the budget to improve education and health facilities. According to Saparini (2014), The three main and fundamental problems in the Indonesian economy macro-economically are the problem of employment or unemployment and high inflation, and relatively low and low-quality economic growth. Countermeasures or policies on these two problems cannot be prioritized which will be resolved first, everything depends on the structural conditions of the economy.

The bad impact caused by the phenomenon of inflation is the increase in prices that soar above people’s purchasing power so that the economy becomes stuck or even stops. The stagnation of the economy will cause a lot of damage in the community, including hunger, poverty, and unemployment caused by a decrease in people’s supply and purchasing power so it kills the rate of productivity. Therefore, the level of inflation that occurs in a country is one measure to measure the merits of the economic problems faced by a country (Rozalinda, 2015). On the other hand, there research put forward by (Eny & Anton, 2020) where from his research it was concluded that inflation has a positive effect on economic growth in the short term and has a negative effect in the long term.

Another macroeconomic problem, namely unemployment is also closely related to economic growth. The two also have a negative relationship. The high number of unemployed resulted in the state being unable to promote growth in the economic sector. The existence of unemployment has a significant impact on people’s purchasing power so the demand for produced goods and services will decrease, such conditions do not stimulate investors to expand or establish new industries. Thus, the level of investment will decrease so that economic growth will not be accelerated (Subhan, 2018).

Based on research conducted by (Zulhanafi, et al., 2013), it was found that there is a significant influence between the unemployment rate and economic growth indicating that the unemployment rate is influenced by economic growth. If economic growth increases, it means that there has been an increase in the production of goods and services, because the
increase in the production of goods and services will cause an increase in the factors of production, one of which is labor. This increase in demand for labor will result in a decrease in the unemployment rate so that a decrease in the unemployment rate will increase economic growth.

The findings of different study results were carried out by (Pradana, et al., 2021) it was found that economic growth has a positive and significant effect on unemployment. This means that if economic growth increases, unemployment will increase. Economic growth has a positive and significant effect on inflation. This means that if economic growth increases, inflation will also increase. Unemployment has a negative and insignificant effect on inflation. This means that if unemployment increases then inflation will decrease. Thus, economic growth has a positive and significant effect on unemployment and inflation. Unemployment has a negative and insignificant effect on inflation. Thus, economic growth has an indirect and negative effect on inflation through unemployment.

Kusumatriisna (2019), in his journal, stated that the growth in the ratio of government spending has a significant negative effect on economic growth in all regional regions and at the national level. Each increase in the ratio of government spending by 1 percent will significantly reduce economic growth by 0.22 percent at the national level, 0.13 percent for western Indonesia, and 0.29 percent for eastern Indonesia.

The presentation of the economic problems mentioned above illustrates that the condition of the Indonesian economy is still faced with problems of economic development. So, to stimulate the economy through economic growth requires an increase in production and people’s income. And to encourage economic growth from the government side, government spending is also needed that is right on target. On the other hand, it is also important to reduce the unemployment rate and keep inflation under control, because both are economic problems and can become obstacles for the economy to grow.

The constantly fluctuating economic conditions are always an interesting thing to study. Moreover, the current national economic conditions are faced with new, unexpected
challenges, paralyzing national economic growth and slowing down on all sides in 2020 due to the emergence of the covid 19 virus, and then in 2021, Indonesia is able to survive and grow little by little. Various efforts were made to restore the economy. The purpose of this study is to analyze how inflation, unemployment, and government spending affect economic growth in Indonesia in the 2000-2022 period to project the economy in Indonesia in the short term (next 10 years) and in the long term (next 20 years).

REVIEW OF LITERATURE

Economic growth in modern economic terms is a development in the economy that causes the goods and services produced in society to increase, which in turn is accompanied by an increase in people’s prosperity. In macroeconomic analysis, the level of economic growth achieved by a country is measured by the development of real national income achieved by a country, namely the Gross National Product (GNP) or Gross Domestic Product (GDP) (Naf’an, 2014). Al-Tariqi (2004) explains that economic growth is an activity in the field of production that is inseparable from distributional justice. Growth is not only intended for economic activity but a human activity that aims at the material and spiritual progress of humans. Discussion of economic growth can be found in the meaning of “prosperity of the earth” which is stated in Al-Quran Surah Hud (11) verse 61 which means:

"And to Thamud (We sent) their brother Shaleh. Saleh said: "O my people, worship Allah, there is absolutely no god for you but Him. He has created you from the earth (soil) and made you prosperous, therefore ask His forgiveness, then repent to Him, verily my Lord is very near (His grace) again allowing (the prayer of His servant)."

According to Sukirno (2004), GDP is the value of goods and services produced within a country in a given year. Includes factors of production belonging to its own citizens as well as those belonging to foreign nationals who produce within the country. This GDP calculation includes the production of goods and services produced by foreign companies/individuals operating in the territory of the country concerned. The goods produced include capital goods for which depreciation has not been calculated, therefore
the amount obtained from GDP is considered to be gross/gross. In essence, GDP is the monetary value of the entire production of goods and services produced in a country in a certain period (Kuncoro, 2013).

Inflation is a problem faced by all countries in the world and is difficult to avoid, but every government always tries to prevent and overcome this economic phenomenon. Quoted in Amalia (2005) that according to Taqiyuddin Ahmad ibn al-Maqrizi (1364-1441) that inflation is a phenomenon in the economy that occurs because it is caused by continuous increases in general prices and has an impact on the scarcity of supplies of goods and services, so as to meet the demand for these goods and services, consumers must spend more money. The early history of the emergence of the phenomenon of inflation was a result of the enactment and circulation of dinars that were no longer pure. Then, at present, the application of paper currency exacerbates the impact caused by inflation and is difficult to prevent. In fact, scholars have warned about this, one of them is Imam Syafi’i, he forbade the minting of impure dirhams by the government because it will damage the value of the currency, cause prices to increase, and this can harm the wider community and cause a lot of mafsada (Barito & Ali, 2004).

Unemployment is not related to those who do not work but do not or have not found a job. So, unemployment is a group of people who want to work, and are trying to get a job but have not succeeded in getting it (Ibrahim, 2013). Unemployment is a strategic problem in the macroeconomy because it directly affects the standard of living and the pressure on community psychologists (Hasyim, 2016). When a country can employ as many jobs as possible, the country will achieve a higher level of GDP than a country where the number of jobs is not optimal (Mankiw, 2006).

According to Ibnu Khaldun, the expenditure side of public finance is very crucial. Because, without government spending or state spending such as infrastructure development, it is impossible to realize a large population. The more the government spends, the better for the economy (Karim, 2020.) In terms of expenditure, Al Qur’an has established a broad spending policy for a balanced wealth distribution of income. In Al
Qur’an Surah Al-Baqarah Verse 219, which means: "And they ask you what they spend, say more than necessary."

**Conceptual Framework**

![Conceptual Framework Diagram]

**Figure 1**

Conceptual Framework

The conceptual framework above it can be explained as follows:

H1: there is an influence and relationship between economic growth and inflation in Indonesia.
H2: there is an influence and relationship between economic growth and the open unemployment rate in Indonesia.

H3: there is an influence and relationship between economic growth and government spending.

**Hypothesis**

The alleged results of the temporary research are contained in the following hypothesis:

H0: The influence and relationship between economic growth and inflation in Indonesia are not significant

H1: The influence and relationship between economic growth and inflation in Indonesia are significant

H0: The influence and relationship between economic growth and the open unemployment rate in Indonesia are not significant

H2: The influence and relationship between economic growth and inflation in Indonesia is significant

H0: The influence and relationship between economic growth and government spending in Indonesia is not significant

H3: The influence and relationship between economic growth and government spending in Indonesia is significant.

**RESEARCH METHOD**

This type of research uses quantitative methods, quantitative methods are research methods based on the philosophy of positivism, are used to examine certain populations or samples, sampling techniques are generally carried out randomly, data collection uses research instruments, data analysis is quantitative/statistical with the aim to test the hypotheses that have been set (Sugiyono, 2015).
The nature of this research is associative research, to determine the effect or relationship between two or more variables (Sugiyono, 2015). In this research, the researchers want to know the relationship between Inflation, Unemployment, and Government Expenditure on Economic Growth, then it will be analyzed from an Islamic perspective.

The population in this study is Inflation, Unemployment, Government Expenditure, and GDP in Indonesia because this research wants to find out how the influence between these variables. The samples taken by researchers to be tested are in the form of data, and the data are as follows: GDP at constant prices (the base year 2010), GDP Deflator, Open Unemployment Rate, and Government Expenditure, where each variable to be examined is annual data from the year 1990 to 2022 so that the number of samples in this study totaled 128 samples.

The type of data used in this study is secondary data, namely data obtained indirectly (Sugiyono, 2015). It is also time series data. The data collected is in the form of a collection of articles (online print media, journals, and others) by using a purposive sampling technique to determine the information. The data used in this study comes from the official website of SEKI-BI, the Central Bureau of Statistics, the World Bank, and SIMREG (Regional Basic Data Management and Information System). While technical data analysis uses Vector Autoregressive Analysis (VAR) and Vector Error Correction Model (VECM).

RESULTS AND DISCUSSION

Based on the research results above, the writer can interpret the variables used in this study, including:

Stationary Test

In testing stationary data, eviews 8 software was used. The method used to carry out the unit root test in this study was the Augmented Dickey-Fuller Test (ADF Test). In the ADF test, if the variable is not stationary at the level, then the stationary test must be
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continued with a test for a unit root in 1st difference, with the same procedure as at the level.

The standard for determining whether or not data is stationary is the ADF (Augmented Dickey Fuller) value. If the ADF value is greater than the critical value, then there is a unit root and it is not stationary. Conversely, if the ADF value is less than the critical value of 5%, then there is no unit root and the data is stationary. Besides that, whether data is stationary or not can be seen through the prob*, where if the prob is smaller than 0.05 then the data is said to be stationary. The following are the results of the stationary tests that have been carried out:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unit Root</th>
<th>Prob*</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Levels</td>
<td>0.0027</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>First diff</td>
<td>0.0000</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>GDP Deflator Levels</td>
<td>0.0536</td>
<td>Not Stationary</td>
<td></td>
</tr>
<tr>
<td>First diff</td>
<td>0.0000</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>TPT Levels</td>
<td>0.2767</td>
<td>Not Stationary</td>
<td></td>
</tr>
<tr>
<td>First diff</td>
<td>0.0000</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>Government Expenditure</td>
<td>0.9999</td>
<td>Not Stationary</td>
<td></td>
</tr>
<tr>
<td>First diff</td>
<td>0.0031</td>
<td>Stationary</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 2 above, it is found that the ADF value of the GDP variable is stationary at the level. However, the other three variables, namely the GDP deflator, TPT, and government spending, are not stationary at this level. The VAR model needs to be checked for stationarity at the first difference level. At the first different level, all variables are stationary, meaning that these variables already have a consistent mean and variance. so that the test phase can be continued.

**Optimum Lag Test**

The optimum lag test is used to determine the length of the period of influence on one endogenous variable over time and on other endogenous variables. Determination of the optimum lag is carried out based on the criteria of AIC (Akaike Information Criterion),
SC (Schwarz Information Criterion), and HQ (Hannan Quinnon). The selected lag is the model with the smallest value of AIC and SC. And the greatest value of HQ.

**Table 2**

**Lag Test Results**

<table>
<thead>
<tr>
<th>lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-643.4240</td>
<td>NA</td>
<td>6.53e+13</td>
<td>43.16160</td>
<td>43.34842*</td>
<td>43.22136</td>
</tr>
<tr>
<td>1</td>
<td>-616.2509</td>
<td>45.28846*</td>
<td>3.14e+13</td>
<td>42.41673</td>
<td>43.35086</td>
<td>42.71556*</td>
</tr>
<tr>
<td>2</td>
<td>-597.5634</td>
<td>26.16252</td>
<td>2.80e+13*</td>
<td>42.23756*</td>
<td>43.91899</td>
<td>42.77546</td>
</tr>
</tbody>
</table>

* Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Determining the optimal lag is very important because the independent variable used is none other than the lag of the endogenous variable. Recommended optimal lag is indicated by an asterisk (*). From the test results, the most frequent lag orders indicated by an asterisk (*) are in lag 2. as the criteria indicated by the AIC value (Akaike information criterion) is the smallest and the largest HQ (Hannan Quinnon) value is at lag 2. This implies that the response shown by the variable in response to changes in the variable that becomes the determinant will be seen (the longest) after 2 post-shock periods.

**VAR Stability Test**

Before entering the further analysis stage, the results of the VAR estimation that have been determined need to be tested for stability, so a VAR Condition Stability Check is...
carried out, namely in the form of roots of the characteristic polynomial. A VAR model is said to be stable if all of its roots have a modulus smaller than 1. The following are the results of the VAR stability test:

Table 3
VAR Stability Test Results

<table>
<thead>
<tr>
<th>Roots</th>
<th>Modulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.693006 - 0.439598i</td>
<td>0.820673</td>
</tr>
<tr>
<td>-0.693006 + 0.439598i</td>
<td>0.820673</td>
</tr>
<tr>
<td>0.129883 - 0.750828i</td>
<td>0.761979</td>
</tr>
<tr>
<td>0.129883 + 0.750828i</td>
<td>0.761979</td>
</tr>
<tr>
<td>0.685741</td>
<td>0.685741</td>
</tr>
<tr>
<td>0.368260</td>
<td>0.368260</td>
</tr>
<tr>
<td>-0.268462 - 0.217813i</td>
<td>0.345708</td>
</tr>
<tr>
<td>-0.268462 + 0.217813i</td>
<td>0.345708</td>
</tr>
</tbody>
</table>

Source: Data Processing Output

Based on the VAR stability test as shown in the table above, the VAR stability test results show that the VAR model formed is stable because the modulus range is < 1 at lag 1, so the model is stable at that lag. Apart from seeing the modulus number which is smaller than 1, stability can also be proven by looking at the results of data processing in the form of the following graph:

![Inverse Roots of AR Characteristic Polynomial](image)

Figure 2
VAR Stability Test Results
Based on the graph above, we can see that the distribution of the inverse roots of AR Characteristic Polynomial points is in a circle, so this condition indicates that the VAR model is stable and later the results from IRF and FEVD are valid.

**Granger Causality Test**

The Granger causality test is a method used to analyze the causality relationship between observed research variables so that it is known whether an endogenous variable can be treated as an exogenous variable. This stems from ignorance of the influence between variables. If there are two variables y and z, then does y cause z or z causes y or both are valid or there is no relationship between the two. The y variable causes the z variable, meaning how much the z value in the current period can be explained by the z value in the previous period and the y value in the previous period. Usually, if the variable probability coefficient is less than 0.05 it can be said that there is a relationship between variables, y causes z, or y is influenced by z.

The initial hypothesis (H0) tested was that there was no causality relationship, while the alternative hypothesis (Ha) was that there was a causality relationship. The criteria for accepting or rejecting H0 are done by comparing the probability value with the critical value used. The critical value used in this study is 5%. H0 is rejected if the probability value is less than the critical value, and or F-Statistics > F-table, so that there is a causal relationship between the variables tested.

**Table 4**

**Granger Causality Test Results**

<table>
<thead>
<tr>
<th>Null Hypothesis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDB_DEFLATOR does not Granger Cause</td>
</tr>
<tr>
<td>PDB does not Granger Cause PDB_DEFLATOR</td>
</tr>
<tr>
<td>TPT does not Granger Cause PDB</td>
</tr>
<tr>
<td>PDB does not Granger Cause TPT</td>
</tr>
<tr>
<td>GE does not Granger Cause GDP</td>
</tr>
</tbody>
</table>
From the results obtained in the table above, it is known that those that have a causal (reciprocal) relationship are those that have a smaller probability value than alpha 0.05 so that later H0 will be rejected which means that a variable has a causal relationship with other variables. From the Granger test above, we know the causality relationship as follows:

1) The GDP deflator variable does not statistically significantly affect GDP (0.74) so we can accept H0, as well as the GDP deflator variable statistically does not significantly affect GDP deflator (0.63) so we accept H0. Thus, it is concluded that there is no causal relationship between the GDP and GDP deflator variables.

2) The TPT variable does not statistically significantly affect GDP (0.79) so we accept H0. Likewise, the GDP variable does not statistically significantly affect TPT (0.60) so we can accept H0. Thus, it is concluded that there is no causal relationship between GDP and TPT variables.

3) The GE variable does not statistically significantly affect GDP (0.95) so we can accept H0, as well as GDP does not statistically significantly affect GE (0.89) so we accept H0. Thus, it is concluded that there is no causal relationship between GDP and GE variables.

4) The TPT variable statistically does not significantly affect the GDP deflator (0.79) so we can accept H0, as well as the GDP deflator does not statistically significantly
affect TPT (0.37) so we accept H0. Thus, it is concluded that there is no causal relationship between TPT and GDP deflator variables.

5) The GE variable statistically significantly affects the GDP deflator (0.04) so we reject H0, while the GDP deflator does not statistically significantly affect GE (0.98) so we accept H0. Thus, it is concluded that there is a unidirectional relationship between the GE variable and the GDP deflator.

6) The GE variable statistically does not significantly affect TPT (0.54) so we can accept H0, as well as TPT does not statistically significantly affect GE (0.20) so we accept H0. Thus, it was concluded that there was no causal relationship between the TPT and GE variables.

Cointegration Test

The cointegration test was carried out to find out whether there will be a balance in the long run, namely whether there is a similarity in movement and stability of the relationship between the variables in this study or not. In this study, the cointegration test was carried out using Johansen’s cointegration test method. Long-term information is obtained by first determining the cointegration rank to find out how many systems of equations can explain the entire existing system. To determine the existence of cointegration seen from the trace statistical value compared to the critical value (5%), it can be concluded that these variables have cointegration.

To test cointegration using the following hypothesis:

H0 = no cointegration
Ha = there is cointegration

The test criteria are:

1) H0 is rejected and Ha is accepted, if the value of the trace statistic > critical value is 5%
2) H0 is accepted and Ha is rejected if the trace statistic value < critical value 5%

If it is proven that there is cointegration, then the VECM test must be carried out. However, if it is not proven, then the VECM test is not necessary.
Based on the test results in the table above, it can be concluded that in this study there is cointegration seen from the trace statistical value (69.49259) > critical value (47.85613), H0 is rejected and Ha is accepted, which means that the variables have cointegration. This means that it is necessary to proceed to the VECM stage.

**VECM Model Estimation**

After conducting a cointegration test on the VAR model, cointegration was found in the model equation in this study. Therefore, the next test phase is continued, namely the estimation of the VECM model. This study uses a significant level of 5% as the significance of a variable to other variables. So, to analyze the effect of the GDP Deflator, TPT, and GE variables on GDP it can be seen by comparing the t-statistic values. If the value of the t-statistic > the value of the t-table, it is said that the variable has a statistically significant influence. The t table value in this study is (1.97928). As for analyzing the effect of the independent variables on the dependent variable in the short and long term, it can be seen based on the VECM estimation results below:

The following is the GDP variable equation formed from the model estimation results
D(PDB,2) = 0.641347139999* (D(PDB(-1)) + 0.925510893035* D(PDB_DEFLATOR(-1)) + 2.6585052645* D(TPT(-1)) - 23.7888771087* D(LOG(GE(-1)))) + 3.05841040126 - 1.27607954581* D(PDB(-1),2) - 0.646992107059* D(PDB(-2),2) - 0.456577771398* D(PDB_DEFLATOR(-1),2) - 0.156691589292* D(PDB_DEFLATOR(-2),2) - 2.1105508945* D(TPT(-1),2) - 2.46107481037* D(TPT(-2),2) + 0.713403031685* D(LOG(GE(-1)),2) + 0.302706420466*D(LOG(GE(-2)),2) + 0.488284171759

From the estimation results of the VECM model, it is known that in the short term, the variables that have a significant negative effect on GDP are the GDP deflator variable (2.45375) > (1.97928) and TPT (3.05958) > (1.97928). There is a GE variable (0.44254) < (1.97928), statistically not significant in influencing GDP but in the short-term GE has a positive influence on GDP although not significant.

As for the long term, it can be seen that the variables that significantly affect the GDP variable are the GDP Deflator, TPT, and GE variables. and in the long run, GE has a significant negative effect on GDP. This can be seen from the T-statistics > T table (1.97928). Where for T table PDB Deflator (10.6964) > (1.97928). And T table TPT (3.76969) > (1.97928). The T table GE (4.68455) > (1.97928). Based on adj. R Squared GDP variable of 0.660685, which means that the lag and independent variables selected in this study can explain the GDP variable by 66%.

Test Models

Analysis of Impulse Response Function

Estimation of the Impulse Respond Function (IRF) is carried out to see the shock or shock response of the innovation variable to other variables. In addition, this method aims to see how long the shock of one variable affects other variables. In this model, the response of changes in each variable in the presence of new information is measured with a 1 standard deviation. The horizontal axis shows the period, where one period represents one month, while the vertical source is the response value. In this case, the authors use a period of up to 50 years or the same as for the next 50 years. Fundamentally, in this analysis, it will be known the positive or negative response of a variable to other variables.
Based on the results of the Impulse Response Function, we can see that the shock resulted from the previous period’s GDP, the GDP Deflator, TPT and GE were very volatile and unstable in the short term, the biggest shock was found in the early period of year 1 to year 20, then the shock subsides from the mid to late period (25th year to 50th year), in the final period the shocks are still starting to stabilize. However, through this analysis it cannot be seen how much the contribution of each variable affects GDP, to be able to find out about this, the next stage of analysis is continued, namely Forecast Variance Decomposition.

**Forecast Variance Decomposition Analysis**

Forecast Error Variance Decomposition is a method used to see how changes in a variable indicated by changes in error variance are affected by other variables. This analysis is used to calculate the effect of random shocks from certain variables on endogenous variables. With this method we can see the strengths and advantages of each variable in influencing other variables over a long period of time.
Table 6
Variance Decomposition of PDB Test Results

Variance Decomposition of D(PDB):

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Based on the FEVD results table, in the first period, it shows that the forecast error variance of GDP is determined by the four variables, namely GDP, GDP Deflator, TPT, and GE. However, the biggest contribution is influenced by the GDP variable itself by 98%. Then in the next period, it appears that the variability of GDP begins to be explained by other variables, where the contribution of GDP decreases but is still dominant until the 50th period. The contribution of other variables is getting bigger than in previous periods. This shows that the contribution of the GDP Deflator variable, TPT, and Government Expenditures has a greater contribution in the long term.

**Forecasting Results**

![Figure 4](image_url)

*Projection Analysis of Economic ....*
Based on forecasting trends using the VECM model equation, it was found that in the 5\textsuperscript{th} to 10\textsuperscript{th} year the GDP will experience a fluctuating trend. Meanwhile, in the long term, from the 15\textsuperscript{th} year to the 50\textsuperscript{th} year, there will be an increase. This is of course due to government policies that synergize to carry out economic recovery because if we examine the trend of Indonesia's GDP after the recession in 1998, it has recovered in the following years. Followed by an increase in the value of GDP in the next period. After the pandemic hit the Indonesian economy to -(minus), the government made synergistic efforts for recovery, and the GDP figure itself in 2021-2022 has increased.

Figure 5

Based on forecasting trends using the VECM model equation, it was found that in the 5\textsuperscript{th} to 10\textsuperscript{th} year the GDP will experience a fluctuating trend. Meanwhile, in the long term, from the 15\textsuperscript{th} year to the 50\textsuperscript{th} year, it will decrease. Of course, we need a safe inflation rate in running the economy, if inflation tends to bend sharply downwards or continues to experience a very significant decline as predicted in the 15\textsuperscript{th} to 50\textsuperscript{th} year, this indicates an inability to spend by the public. Of course, the ultimate goal of both conventional and Islamic economics is balance.
Based on the forecasting results, it was found that the highest unemployment rate is in the fifth year, or if it is calculated based on the final research data, namely in 2022, then in the next 5 years unemployment will be very high. However, if accompanied by appropriate government policies in an effort to recover the economy, the open unemployment rate will decrease as predicted using the VECM equation model.

From the forecasting results of the VECM model, the most volatile finding in the short term is this GE variable, when compared to the other three variables, namely: GDP, GDP Deflator, and TPT.
The Effect of the GDP Deflator on GDP

From the estimation results of the VECM model, it is known that the GDP Deflator variable (-2.45375) > (1.97928) statistically has a significant negative effect on GDP in the short term. As for the long term, it can be seen that the GDP Deflator variable has a significant positive effect on GDP. This can be seen from the T-statistics > T table (1.97928). Where for T table PDB Deflator (10.6964) > (1.97928). This can also be found from the findings of the IRF were, in the long term, namely in the 25\textsuperscript{th} to 50\textsuperscript{th} period. And based on the results of the causality test, no reciprocal relationship was found between the GDP Deflator and GDP variables. Which means the relationship between these variables is unidirectional.

Effect of Open Unemployment Rate on GDP

From the estimation results of the VECM model, it is known that in the short term, the TPT variable (-3.05958) > (1.97928) has a significant negative effect on GDP. As for the long term, it can be seen that the TPT variable has a significant effect on GDP, this is evidenced by the results of data processing where T table TPT (3.76969) > T statistic (1.97928). Based on the results of the causality test, no reciprocal relationship was found between the TPT and GDP variables. Which means the relationship between these variables is unidirectional.

Effect of Government Expenditure on GDP

From the estimation results of the VECM model, it is known that in the short term the variable GE (0.44254) < (1.97928) statistically not significant in influencing GDP but in the short-term GE has a positive influence on GDP although not significant. As for the long term, it can be seen that the GE variable has a significant negative effect on GDP. This can be seen from the T-statistics > T table (1.97928). The T table GE (4.68455) > (1.97928). And based on the results of the causality test, no reciprocal relationship was found between GE and GDP variables. Which means the relationship between these variables is unidirectional.
CONCLUSION

From the estimation results of the VECM model, it is known that in the short term, the variables that have a significant negative effect on GDP are the GDP deflator variable (2.45375) > (1.97928), and TPT (3.05958) > (1.97928). There is a GE variable (0.44254) < (1.97928) statistically not significant in influencing GDP but in the short-term GE has a positive influence on GDP although not significant.

As for the long term, it can be seen that the variables that significantly affect the GDP variable are the GDP Deflator, TPT and GE variables. and in the long run GE has a significant negative effect on GDP. This can be seen from the T-statistics > T table (1.97928). Where for T table PDB Deflator (10.6964) > (1.97928). And T table TPT (3.76969) > (1.97928). The T table GE (4.68455) > (1.97928). Based on adj. R Squared GDP variable of 0.660685, which means that the lag and independent variables selected in this study can explain the GDP variable by 66%.

Based on the results of the Impulse Response Function, we can see that the shock resulted from the previous period's GDP, the GDP Deflator, TPT and GE were very volatile and unstable in the short term, the biggest shock was found in the early period of year 1 to year 20, then the shock subsides from the mid to late period (25th year to 50th year), in the final period the shocks are still starting to stabilize.

The biggest contribution to GDP is influenced by the GDP variable itself by 98%. Then in the next period, it appears that the variability of GDP begins to be explained by other variables, where the contribution of GDP decreases but is still dominant until the 50th period. The contribution of other variables is getting bigger than in previous periods. This shows that the contribution of the GDP Deflator variable, TPT, and Government Expenditures has a greater contribution in the long term.

REFERENCES
Projection Analysis of Economic ….


Nuraini, I., & Hariyani, H. (2019). Qualified Economic Growth as an Indicator of


