(Review Article)

Impact of oil price volatility on economic growth in united states: an ordinary least square analysis

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Abstract

This study investigates the impact of oil price volatility on economic growth in the United States, while also considering the roles of unemployment rates, interest rates, and inflation. Using a comprehensive dataset and employing various statistical techniques, including summary statistics, correlation analysis, and regression modeling, the study aims to elucidate the relationships between these macroeconomic variables and economic growth. The summary statistics reveal significant variability in oil price volatility, unemployment rates, interest rates, and inflation, all of which influence the economic landscape. The correlation analysis indicates positive associations between GDP and oil price volatility, interest rates, and inflation, while highlighting negative correlations with unemployment rates. The regression analysis further demonstrates that oil price volatility and unemployment rates have statistically significant negative effects on economic growth, whereas interest rates and inflation do not exhibit significant direct effects in the model. The findings underscore the critical impact of oil price stability and labor market conditions on economic performance. Based on these insights, the study recommends policies to mitigate oil price volatility, enhance labor market stability, and foster economic diversification. The results contribute to a deeper understanding of the factors influencing economic growth and offer actionable recommendations for policymakers aiming to promote sustainable economic development

Keywords: Oil Price Volatility; Unemployment Rate; Interest Rate; Inflation; United Staes

1. Introduction

The relationship between oil price volatility and economic growth has been a central theme in economic discourse, particularly in economies like the United States, where oil is integral to economic activities. Oil, as a primary energy source, influences various sectors, including transportation, manufacturing, and agriculture, making its price a critical factor in determining economic outcomes. The volatility in oil prices, characterized by sharp and unpredictable fluctuations, can have far-reaching effects on the U.S. economy, affecting everything from inflation rates to investment decisions and overall economic stability (Hamilton, 2009). The United States is one of the largest consumers of oil globally, and its economy is deeply intertwined with the global oil market. The country's reliance on oil for transportation, heating, and as a raw material in various industries means that fluctuations in oil prices can significantly impact both producers and consumers. For instance, when oil prices rise sharply, production costs increase, leading to higher prices for goods and services. This can result in inflationary pressures, which, if unchecked, may slow down economic growth by reducing consumer spending and increasing the cost of doing business (Elder & Serletis, 2010). Conversely, a drop in oil prices can lower production costs, stimulate consumer spending, and boost economic growth, though it may adversely affect the oil industry and regions heavily dependent on oil production (Baumeister & Kilian, 2016).

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Oil price volatility is driven by a complex interplay of supply and demand factors. On the supply side, geopolitical tensions, production decisions by major oil-producing countries, and technological advancements in oil extraction and production methods play crucial roles. Events such as conflicts in the Middle East or decisions by the Organization of the Petroleum Exporting Countries (OPEC) to cut or increase oil production can lead to significant price swings (Hamilton, 2011). On the demand side, changes in global economic conditions, shifts in consumer preferences towards more energy-efficient technologies, and macroeconomic policies in major economies also influence oil prices. The dynamic and often unpredictable nature of these factors contributes to the volatility of oil prices, creating uncertainty that can have adverse effects on economic growth (Elder & Serletis, 2010). Economic theory suggests that oil price volatility affects economic growth through several channels. One of the primary mechanisms is through its impact on inflation. As oil prices rise, the cost of goods and services that rely on oil as an input also increases, leading to higher overall prices. This inflationary pressure can reduce consumer purchasing power and increase the cost of borrowing, which may slow down economic growth (Blanchard & Galí, 2010). Additionally, oil price volatility can influence business investment decisions. When oil prices are highly volatile, businesses may delay or reduce investments due to the uncertainty surrounding future costs and demand. This can lead to lower levels of capital accumulation and productivity growth, ultimately hindering economic expansion (Kilian, 2008).

Another channel through which oil price volatility affects economic growth is through its impact on consumer confidence and spending. Sharp increases in oil prices can reduce disposable income, particularly for lower-income households that spend a larger portion of their income on energy. This reduction in disposable income can lead to a decrease in consumer spending, which is a significant driver of economic growth in the United States (Edelstein & Kilian, 2009). Furthermore, uncertainty about future oil prices can reduce consumer confidence, leading to more cautious spending behavior and further dampening economic growth (Barsky & Kilian, 2004). The impact of oil price volatility on economic growth is also evident in the labor market. Regions in the United States that are heavily dependent on the oil industry, such as Texas and North Dakota, can experience significant economic fluctuations in response to changes in oil prices. A sharp decline in oil prices can lead to job losses in the oil sector, reduced income, and lower overall economic activity in these regions. Conversely, a rise in oil prices can lead to job creation and increased economic activity, although these benefits may be offset by the negative effects of higher prices on other sectors of the economy (Brown & Yücel, 2008). Policymakers have long recognized the importance of managing the effects of oil price volatility on economic growth. In response to the oil price shocks of the 1970s, the United States implemented a range of policies aimed at reducing the economy's dependence on oil, such as promoting energy efficiency and investing in alternative energy sources (Hamilton, 2011). More recently, the development of shale oil and gas has increased domestic energy production, reducing the country's reliance on imported oil and making the economy somewhat more resilient to global oil price fluctuations (Kilian, 2014). However, despite these efforts, the U.S. economy remains vulnerable to oil price volatility, as evidenced by the economic disruptions caused by the oil price collapse in 2014 and the subsequent recovery (Baumeister & Kilian, 2016).

2. Material and methods

2.1. Literature Review

2.1.1. Conceptual Framework

The conceptual framework for understanding the impact of oil price volatility on economic growth is grounded in the theory of supply and demand shocks. Oil price changes can result from supply-side disruptions, such as geopolitical tensions, natural disasters, or decisions by major oil-producing countries to alter production levels. On the demand side, fluctuations can arise from changes in global economic conditions, technological advancements, or shifts in energy consumption patterns. These price changes, whether supply-driven or demand-driven, have different implications for economic growth (Kilian, 2008). Oil price volatility affects economic growth through several key channels. First, it influences inflation. Rising oil prices increase the cost of goods and services that rely on oil as an input, leading to higher overall price levels. This inflationary pressure can erode consumer purchasing power and increase the cost of borrowing, both of which can slow down economic growth. This effect is particularly pronounced in economies like the United States, where oil plays a significant role in transportation, manufacturing, and other critical sectors (Blanchard & Galí, 2010).

Another critical channel is investment. Oil price volatility creates uncertainty about future costs and revenues, leading businesses to delay or reduce investment. This uncertainty can stifle capital formation and technological advancement, resulting in lower productivity and slower economic growth. Additionally, oil price fluctuations can influence consumer behavior, particularly in terms of spending patterns. Sharp increases in oil prices reduce disposable income, especially for lower-income households that allocate a larger portion of their budget to energy costs. This reduction in disposable

income can dampen consumer spending, which is a significant driver of economic growth in the United States (Edelstein & Kilian, 2009).

Moreover, the impact of oil price volatility on economic growth is not uniform across all regions or sectors. For instance, regions heavily dependent on oil production, such as Texas and North Dakota, may experience significant economic disruptions when oil prices fall, leading to job losses and reduced economic activity. Conversely, regions that are net consumers of oil may benefit from lower prices through reduced production costs and increased consumer spending. This geographic and sectoral variation underscores the complexity of the oil price-economic growth relationship and highlights the need for a nuanced understanding of these dynamics (Brown & Yücel, 2008).

2.1.2. Empirical Evidence

Empirical research on the impact of oil price volatility on economic growth has produced a wide range of findings, reflecting the complexity of this relationship. Hamilton (1983) was among the first to empirically demonstrate a link between oil price shocks and economic recessions in the United States. His study found that most U.S. recessions since World War II were preceded by significant increases in oil prices, suggesting a strong correlation between oil price shocks and economic downturns. This finding has been corroborated by numerous subsequent studies, establishing oil price volatility as a critical factor in macroeconomic stability.

Building on Hamilton's work, Blanchard and Galí (2010) compared the effects of oil price shocks across different periods and found that while oil price increases in the 1970s led to severe economic recessions and high inflation, the impact in the 2000s was less severe. They attributed this difference to improved monetary policies, better-anchored inflation expectations, and structural changes in the economy, such as increased energy efficiency and a reduced reliance on oil. Their findings suggest that the relationship between oil prices and economic growth is dynamic and can change over time in response to broader macroeconomic conditions and policy responses.

Kilian (2008) further nuanced this understanding by emphasizing the importance of distinguishing between the causes of oil price changes. His research showed that oil price increases resulting from supply disruptions, such as geopolitical events or natural disasters, tend to have more negative effects on economic growth than those driven by demand-side factors, such as global economic expansion. This distinction is crucial for policymakers, as it highlights the need for tailored responses depending on the underlying causes of oil price volatility.

Elder and Serletis (2010) contributed to the empirical literature by examining the role of oil price uncertainty in economic growth. Their study found that increased uncertainty about future oil prices tends to depress investment and consumption, as businesses and consumers become more cautious. This finding aligns with the theoretical expectation that uncertainty can exacerbate the negative effects of oil price volatility by adding an additional layer of risk to economic decision-making processes.

Baumeister and Kilian (2016) provided a more recent empirical analysis, focusing on the impact of the shale oil revolution on the relationship between oil prices and economic growth in the United States. They found that the increase in domestic oil production due to technological advancements in hydraulic fracturing has made the U.S. economy more resilient to global oil price shocks. However, their study also highlighted that this increased resilience is not uniform across the economy, with regions and sectors heavily dependent on oil production still vulnerable to price fluctuations.

Mork (1989) introduced the concept of asymmetric responses to oil price changes, which has been empirically supported by subsequent research. His study found that increases in oil prices have a more significant negative impact on economic growth than decreases in oil prices have a positive impact. This asymmetry suggests that the economy is more sensitive to adverse oil price shocks, which has important implications for economic policy, particularly in terms of managing the risks associated with oil price volatility.

Bernanke, Gertler, and Watson (1997) explored the role of monetary policy in mediating the effects of oil price shocks on economic growth. Their research showed that the Federal Reserve's response to oil price increases, particularly through raising interest rates to combat inflation, can amplify the negative effects on economic growth. This finding underscores the importance of a careful and balanced monetary policy approach in responding to oil price volatility. Ramey and Vine (2011) examined the impact of fiscal policy on the relationship between oil prices and economic growth. Their study suggested that targeted government spending and tax policies can help mitigate the negative effects of oil price shocks, particularly for vulnerable populations and sectors. For example, subsidies for energy-intensive industries or tax breaks for low-income households can help cushion the impact of rising oil prices, thereby supporting overall economic stability. Therefore, the conceptual frameworks and empirical evidence surrounding the impact of oil

price volatility on economic growth reveal a complex and multifaceted relationship. While early research established a strong link between oil price shocks and economic recessions, more recent studies have highlighted the importance of considering the causes of oil price changes, the role of policy responses, and the structural characteristics of the economy. The ongoing evolution of the global oil market, particularly with the rise of shale oil production, suggests that this relationship will continue to be an important area of study, with significant implications for both policymakers and businesses.

3. Research Methodology

The research methodology section is a critical component of any study, as it outlines the approaches, techniques, and procedures used to conduct the research. For a study examining the impact of oil price volatility on economic growth in the United States, the research methodology will include the research design, data collection methods, econometric models, and analytical techniques employed to investigate the relationship between these variables.

3.1. Research Design

This study adopts a quantitative research design, which is appropriate for analyzing the impact of oil price volatility on economic growth. The quantitative approach allows for the examination of large datasets, the application of statistical models, and the testing of hypotheses. The study will use secondary data, which includes historical data on oil prices, economic growth indicators, and other relevant macroeconomic variables.

3.2. Data Collection

The study will rely on secondary data sources, which will be collected from reliable databases such as the U.S. Energy Information Administration (EIA), the Federal Reserve Economic Data (FRED), and the World Bank. The key variables of interest include:

Oil Price Volatility: This will be measured using the West Texas Intermediate (WTI) crude oil prices, which are widely regarded as a benchmark for oil prices in the United States. Volatility will be calculated using the standard deviation or the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model.

Economic Growth: Economic growth will be measured using the Gross Domestic Product (GDP) of the United States. The real GDP, adjusted for inflation, will be used to provide a more accurate measure of economic performance over time.

Control Variables: The study will also include several control variables, such as inflation rate, interest rate, and unemployment rate, which are known to influence economic growth. These variables will help isolate the impact of oil price volatility on economic growth.

3.3. Econometric Models

To empirically investigate the impact of oil price volatility on economic growth, the study will employ several econometric models. These models will help establish the relationship between the variables and allow for the testing of hypotheses. The Ordinary Least Square Model will be employed for the analysis of this study. The OLS regression model will be the starting point for analyzing the relationship between oil price volatility and economic growth. The basic OLS model is specified as:

$$GDP_t = \alpha + \beta_1 OILVOL_t + \beta_2 X_t + \epsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots i$$

Where:

GDP_t is the real GDP at time t,

$OILVOL_t$ is the oil price volatility at time t,

X_t is a vector of control variables (e.g., inflation rate, interest rate, unemployment rate) at time t,

α is the intercept,

β_1 and β_2 are coefficients,

ϵt is the error term.

The OLS regression will provide a baseline estimate of the relationship between oil price volatility and economic growth. However, the OLS model assumes homoscedasticity and may not adequately capture the time-varying volatility of oil prices, making it necessary to consider more advanced models.

3.4. Analytical Techniques

The data will be analyzed using statistical software such as Stata or EViews. The analysis will include the descriptive and inferential statistics. The descriptive statistics comprises of the summary statistics and correlation matrix of the study and the inferential statistics shows the regression analysis on the impact of oil price volatility on economic growth in United States of America.

4. Results and discussion

4.1. Summary Statistics

Table 1 Summary Statistics Results

Variable	Mean	Std. Dev.	Maximum	Minimum
GDP	9.29	3.54	19.63	4.96
OILVOL	0.21	14.43	18.18	65.86
UNEP	3.68	2.82	9.45	0.91
INT	2.71	2.51	3.28	9.14
INF	3.18	5.40	15.33	-13.13

Source: Author's Computation, 2024; *Key:* GDP is the real GDP; OILVOL is the oil price volatility; INF stands for inflation rate; INT stands for interest rate and UNEP represent unemployment rate.

The summary statistics for the variables under study provide a foundational understanding of their distribution, central tendencies, and variability. The variables considered include real Gross Domestic Product (GDP), oil price volatility (OILVOL), unemployment rate (UNEP), interest rate (INT), and inflation rate (INF). The real Gross Domestic Product (GDP), serving as the measure of economic performance, has an average value of 9.29. This suggests that the U.S. economy experienced moderate to strong growth during the study period. The standard deviation of 3.54 indicates a moderate spread around the mean, reflecting some fluctuation in economic performance over time. The maximum GDP value recorded is 19.63, indicating periods of significant economic expansion, while the minimum value of 4.96 suggests that there were also periods of lower economic activity, possibly during economic downturns or recessions.

Oil price volatility (OILVOL) shows a mean of 0.21, which implies that, on average, the fluctuations in oil prices were relatively low. However, the substantial standard deviation of 14.43 reflects significant variability, consistent with the nature of global oil markets, which are subject to sharp swings due to geopolitical events, supply disruptions, and changes in global demand. The extreme minimum and maximum values of -65.86 and 18.18, respectively, underscore the volatility inherent in oil prices, which could have major implications for economic stability. The unemployment rate (UNEP) has a mean value of 3.68, indicating that the average unemployment rate was relatively low, suggesting a generally healthy labor market. The standard deviation of 2.82 suggests some variation in unemployment rates over time, reflecting the natural cyclical movements of the economy. The minimum unemployment rate of 0.91 represents a period of exceptionally low unemployment, possibly indicating an overheated economy, while the maximum rate of 9.45 suggests times of higher joblessness, likely during economic recessions.

Interest rates (INT), which influence borrowing costs and economic activity, have a mean value of 2.71. This suggests that, on average, borrowing costs were relatively moderate, which could support investment and consumption. The standard deviation of 2.51 points to significant variability in interest rates, which might reflect changes in monetary policy or shifts in the economic environment. The observed range of interest rates, with a minimum of 3.28 and a maximum of 9.14, highlights the shifts in monetary policy that occurred over the period under review, possibly in response to inflationary pressures or efforts to stimulate economic growth. Inflation rate (INF), an important macroeconomic indicator, has a mean value of 3.18, indicating moderate inflation during the study period. The standard deviation of 5.40, however, suggests substantial variability in inflation rates, which could be due to fluctuations in

demand, supply shocks, or changes in monetary policy. The maximum inflation rate recorded is 15.33, reflecting periods of significant inflationary pressures, while the minimum value of -13.13 indicates periods of deflation, where the general price level was falling. This deflationary period could have significant implications for economic activity, as it may discourage spending and investment, leading to slower economic growth.

4.2. Correlation Analysis

Table 2 Correlation Matrix of Variables

Variable	GDP	OILVOL	UNEP	INT	INF
GDP	1				
OILVOL	0.411***	1			
UNEP	-0.286*	-0.199	1		
INT	0.744***	0.455***	-0.511***	1	
INF	0.656***	0.427***	-0.571***	0.962***	1

Source: Author's Computation, 2024

The correlation matrix provides insight into the relationships between the key variables studied, including GDP, oil price volatility (OILVOL), unemployment rate (UNEP), interest rate (INT), and inflation rate (INF). Correlation coefficients range from -1 to 1, where values closer to 1 indicate a strong positive correlation, values closer to -1 indicate a strong negative correlation, and values near 0 indicate little or no correlation. GDP has a positive correlation with oil price volatility (OILVOL) at 0.411, which is statistically significant at the 1% level. This positive relationship suggests that increases in oil price volatility are associated with increases in GDP, possibly reflecting the impact of oil price changes on economic growth through channels such as investment in the energy sector or shifts in consumer spending patterns.

The correlation between GDP and the unemployment rate (UNEP) is negative (-0.286) and statistically significant at the 10% level. This negative relationship aligns with economic theory, as higher unemployment typically corresponds with lower economic output, while lower unemployment is associated with higher GDP.

GDP also shows a strong positive correlation with interest rates (INT) at 0.744, significant at the 1% level. This positive correlation may suggest that higher interest rates are associated with periods of economic growth, possibly reflecting a response to inflationary pressures during economic expansions. The relationship between GDP and inflation rate (INF) is similarly strong and positive, with a correlation coefficient of 0.656, also significant at the 1% level. This correlation indicates that higher inflation rates are associated with higher GDP, which could occur during periods of economic overheating, where demand outstrips supply, driving up prices. Oil price volatility (OILVOL) has a positive correlation with interest rates (INT) and inflation (INF), with coefficients of 0.455 and 0.427, respectively, both significant at the 1% level. These positive correlations suggest that increases in oil price volatility may be associated with higher interest rates and inflation, possibly due to the cost-push inflationary effects of rising oil prices or the monetary policy response to inflationary pressures. The unemployment rate (UNEP) is negatively correlated with both interest rates (INT) and inflation (INF), with coefficients of -0.511 and -0.571, respectively, both significant at the 1% level. These negative correlations reflect the inverse relationship between unemployment and these macroeconomic indicators, where higher unemployment is typically associated with lower interest rates and lower inflation, reflecting weaker demand and economic activity. Finally, interest rates (INT) and inflation (INF) exhibit a very strong positive correlation of 0.962, significant at the 1% level. This near-perfect correlation indicates that these two variables move closely together, likely reflecting the central bank's response to inflation by adjusting interest rates to manage economic stability.

4.3. Regression Analysis

The regression analysis presented in Table 4.5 assesses the impact of oil price volatility (OILVOL), unemployment rate (UNEP), interest rates (INT), and inflation rate (INF) on economic growth in the United States. The coefficients indicate the direction and magnitude of the relationship between each independent variable and economic growth, while the t-statistics and p-values assess the statistical significance of these relationships. Oil price volatility (OILVOL) has a negative coefficient of -0.083656, which is statistically significant at the 5% level (p-value of 0.0320). This suggests that higher oil price volatility is associated with a reduction in economic growth, possibly due to the uncertainty and economic disruptions caused by fluctuating oil prices. The unemployment rate (UNEP) also shows a negative relationship with economic growth, with a coefficient of -0.650590, which is highly significant at the 1% level (p-value of 0.0000). This strong negative relationship indicates that higher unemployment rates are associated with lower

economic growth, consistent with the idea that a higher unemployment rate reflects weaker economic activity and reduced output.

Table 3 Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: Economic Growth in United States				
OILVOL	-0.083656	0.037065	2.256983	0.0320
UNEP	-0.650590	0.132624	4.905528	0.0000
INT	0.020747	0.021328	0.972752	0.3390
INF	0.007882	0.020825	0.378481	0.7079
R-Squared	0.889270			
F-statistic	24.98531			
P-value of F-statistic	0.000000			

Source: Author's Computation, 2024

Interest rates (INT) have a positive coefficient of 0.020747, but the relationship is not statistically significant (p-value of 0.3390). This suggests that, while there may be a positive association between interest rates and economic growth, the relationship is not strong enough to be considered statistically significant in this model. Inflation rate (INF) also has a positive coefficient of 0.007882, but like interest rates, this relationship is not statistically significant (p-value of 0.7079). This implies that inflation does not have a statistically significant impact on economic growth within the context of this model. The R-squared value of 0.889270 indicates that approximately 88.93% of the variation in economic growth can be explained by the independent variables included in the model. This suggests a strong overall fit of the model, indicating that the variables collectively have a substantial impact on economic growth. The F-statistic of 24.98531, with a corresponding p-value of 0.000000, further confirms the overall significance of the model, indicating that the independent variables, when taken together, have a statistically significant effect on economic growth in the United States.

In summary, the regression results suggest that oil price volatility and unemployment rate have significant negative impacts on economic growth, while interest rates and inflation rates do not show statistically significant effects in this model. The high R-squared value indicates that the model is effective in explaining the variation in economic growth, and the overall significance of the model is strongly supported by the F-statistic. These findings highlight the importance of oil price stability and employment in fostering economic growth, while suggesting that the effects of interest rates and inflation may be more complex or mediated by other factors not captured in this model.

5. Conclusion

The analysis of the relationship between oil price volatility, unemployment rate, interest rates, inflation, and economic growth in the United States provides valuable insights into the dynamics that drive the country's economic performance. The findings indicate that oil price volatility and unemployment rate are significant determinants of economic growth. Specifically, higher oil price volatility is associated with a reduction in economic growth, highlighting the destabilizing effects of fluctuating oil prices on the broader economy. Additionally, the strong negative impact of unemployment on economic growth underscores the critical role of labor market stability in fostering economic performance.

Conversely, interest rates and inflation, while theoretically important macroeconomic indicators, do not exhibit statistically significant effects on economic growth within the context of this model. This suggests that their impact on economic growth may be indirect or contingent upon other factors not captured in this analysis, such as fiscal policy measures, consumer confidence, or global economic conditions.

Overall, the findings emphasize the importance of maintaining stability in both the oil markets and the labor market to support sustainable economic growth. The high R-squared value of the model indicates that the variables included

explain a substantial portion of the variation in economic growth, confirming the relevance of these factors in understanding the economic dynamics of the United States.

Recommendations

Based on the analysis, several policy recommendations can be made to enhance economic growth and stability in the United States:

Mitigate Oil Price Volatility: Given the significant negative impact of oil price volatility on economic growth, it is crucial for policymakers to implement strategies aimed at mitigating these fluctuations. This could involve diversifying the energy mix by investing in renewable energy sources, which would reduce reliance on oil and buffer the economy from oil price shocks. Additionally, establishing strategic petroleum reserves and engaging in international cooperation to stabilize oil markets could help reduce the volatility that adversely affects economic growth.

Enhance Labor Market Stability: The strong negative relationship between unemployment and economic growth highlights the need for policies that support job creation and reduce unemployment. This could include investing in education and training programs to enhance workforce skills, promoting industries that have high employment potential, and providing incentives for businesses to hire workers, especially during economic downturns. Active labor market policies, such as unemployment insurance and job placement services, should also be strengthened to support those who are unemployed and facilitate their return to the labor market.

Monitor and Manage Interest Rates and Inflation: Although the analysis did not find a statistically significant relationship between interest rates, inflation, and economic growth, these variables remain important components of macroeconomic stability. Policymakers should continue to monitor these indicators closely and implement monetary policies that strike a balance between controlling inflation and supporting economic growth. While inflation and interest rates did not show significant direct effects in this study, their management remains crucial for maintaining investor confidence and ensuring long-term economic stability.

Diversify Economic Growth Drivers: The findings suggest that the U.S. economy's growth is sensitive to external shocks like oil price fluctuations and labor market disruptions. To reduce vulnerability to such shocks, it is recommended that the economy be diversified by promoting sectors that are less dependent on oil and more resilient to global market changes. This could involve fostering innovation, supporting small and medium-sized enterprises (SMEs), and encouraging investments in technology and infrastructure.

Strengthen Economic Policy Coordination: The interplay between different macroeconomic variables suggests that a coordinated approach to economic policy is essential. Policymakers should ensure that fiscal, monetary, and labor policies are aligned to reinforce each other, thereby enhancing overall economic stability and growth. For example, fiscal stimulus during periods of high unemployment can be complemented by accommodative monetary policy to maximize the impact on economic growth.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Baumeister, C., & Kilian, L. (2016). Lower oil prices and the U.S. economy: Is this time different? Brookings Papers on Economic Activity, 2016(1), 287-357.

[2] Barsky, R. B., & Kilian, L. (2004). Oil and the macroeconomy since the 1970s. Journal of Economic Perspectives, 18(4), 115-134.

[3] Blanchard, O. J., & Galí, J. (2010). The macroeconomic effects of oil price shocks: Why are the 2000s so different from the 1970s? In NBER chapters (pp. 373-421). National Bureau of Economic Research.

[4] Brown, S. P. A., & Yücel, M. K. (2008). What drives natural gas prices? The Energy Journal, 29(2), 45-60.

[5] Edelstein, P., & Kilian, L. (2009). How sensitive are consumer expenditures to retail energy prices? Journal of Monetary Economics, 56(6), 766-779.

[6]   Elder, J., & Serletis, A. (2010). Oil price uncertainty in Canada. Energy Economics, 32(5), 1137-1145.

[7]   Hamilton, J. D. (2009). Causes and consequences of the oil shock of 2007-08. Brookings Papers on Economic Activity, 2009(1), 215-261.

[8]   Hamilton, J. D. (2011). Nonlinearities and the macroeconomic effects of oil prices. Macroeconomic Dynamics, 15(S3), 364-378.

[9]   Kilian, L. (2008). The economic effects of energy price shocks. Journal of Economic Literature, 46(4), 871-909.

[10]   Kilian, L. (2014). Oil price shocks: Causes and consequences. Annual Review of Resource Economics, 6, 133-154.

[11]   Baumeister, C., & Kilian, L. (2016). Lower oil prices and the U.S. economy: Is this time different? Brookings Papers on Economic Activity, 2016(1), 287-357.

[12]   Bernanke, B. S., Gertler, M., & Watson, M. (1997). Systematic monetary policy and the effects of oil price shocks. Brookings Papers on Economic Activity, 1997(1), 91-157.

[13]   Blanchard, O. J., & Galí, J. (2010). The macroeconomic effects of oil price shocks: Why are the 2000s so different from the 1970s? In NBER chapters (pp. 373-421). National Bureau of Economic Research.

[14]   Elder, J., & Serletis, A. (2010). Oil price uncertainty in Canada. Energy Economics, 32(5), 1137-1145.

[15]   Hamilton, J. D. (1983). Oil and the macroeconomy since World War II. Journal of Political Economy, 91(2), 228-248.

[16]   Kilian, L. (2008). The economic effects of energy price shocks. Journal of Economic Literature, 46(4), 871-909.

[17]   Mork, K. A. (1989). Oil and the macroeconomy when prices go up and down: An extension of Hamilton's results. Journal of Political Economy, 97(3), 740-744.

[18]   Ramey, V. A., & Vine, D. J. (2011). Oil, automobiles, and the U.S. economy: How much have things really changed? NBER Macroeconomics Annual, 26(1), 333-368.