



EFFECT OF OIL PRICES ON DIFFERENT COUNTRIES – GDP

Dilshath Hussain.T

I st Year PGDM

Rajalakshmi School Of Business

Nataraj .N

I st Year PGDM

Rajalakshmi School Of Business

Paranthaman .K

I st Year PGDM

Rajalakshmi School Of Business

ABSTRACT

The goal of the paper is to examine the effect of oil prices in different countries on macroeconomic variable as GDP. Let us take the 4 different countries (based on both developing and developed countries) such as Brazil, Russia, India and China. The main objective of this paper is to investigate that whether these macroeconomies are still reactive to oil price movements and comparing their reactions. Monetary variables are also included in this survey because our previous research showed that they have vital role in oil price determination. This paper employed an empirical analysis to examine the impacts of oil price on GDP of the four largest fast growing emerging economies Brazil, Russia, India and China known collectively as the BRIC countries using a sample of observations from 1987 to 2022. Based on the Brazil as average value, we are taken the oil prices for the remaining countries which we taken as Russia, India and China.

INTRODUCTION

Several nations or parts of the world are impacted differently by the price of oil. In general, reduced oil prices are advantageous for importers. This is so that the oil can both enhance customer layout and enhance the country's trade balance. Hence, an increase in oil prices has a detrimental effect on the GDP growth in all nations that import oil. On the other hand, a drop in oil prices is negative for oil exporters since it may result in a drop in their countries' tax receipts, even though oil exports are crucial to both government finances and economic growth. Several countries that export oil rely significantly on exports to fund their economies, so when oil prices drop, their economies suffer and their economic activity booms when oil prices are high. Others have argued that the instability of the oil price is to blame for the weak economic growth of nations that export oil.

Due to its greater significance in meeting the world's energy demands, crude oil has become one of the most important global indicators of economic activity since the middle of the 20th century. Oil makes up a significant component of the gross domestic product expenditures for the creation of energy in more developing nations. Hence, an increase in energy prices causes a significant increase in production costs as well as transportation costs for many businesses. As a result, prices and salaries rise, which may potentially hinder economic growth.

Many studies have shown a strong relationship between GDP and energy costs. Research indicates that rising oil prices have a significant effect on economic activity. According to statistics gathered by the Bloomberg Best Rankings, the United States has been overtaken by the four greatest quickly rising emerging economies—Brazil, Russia, India, and China, or BRIC—in terms of liquid-fuel consumption since 2011. As a result, this research pioneers the subject by specifically looking at how the price of oil affects GDP. The ability of the BRIC countries to accept capitalism and transform their political systems, according to study by the Los Angeles Research Group, has been a major contributor to their success. Each nation also has a huge population and a plenty of resources. The four BRIC countries make up 40% of the world's population, represent 17% of the global economy, and occupy more than 25% of its landmass. China is the second-largest economy in the world, followed by Brazil, India, and Russia. Despite their fast expansion, each BRIC country already makes a sizable contribution to global GDP. According to the 2013 figures from the U.S. Energy Information Administration (EIA), Brazil is the world's tenth-largest energy producer and eighth-largest energy consumer. India, the second-largest energy user in the world after China, is highly reliant on imported crude oil, particularly from the Middle East.

Russia is the world's second-largest producer of dry natural gas and the third-largest producer of liquid fuels. Even though there are large coal resources there, it only generates a little amount of coal. Russia's economy is highly dependent on its hydrocarbon resources, and oil and gas account for more than half of the country's budgetary revenue. There hasn't been much research on the connection between oil prices and GDP. Analysis of the impact of oil prices on the GDP of the BRIC countries—Brazil, Russia, India, and China—from 1987 to 2023 is the main objective of this study.

LITERATURE REVIEW

Oil price and GDP have an empirical relationship, according to a growing body of literature. Since the middle of the 1980s, a change in the pattern of oil price changes has caused this feature to emerge. Ramey and Vine (2011) and Hamilton (2009) conducted studies on the significance of rising oil prices for this economic downturn. According to Kilian (2009), depending on the underlying reason for the price increase, oil price hikes have quite diverse consequences on real economic activity. They came to the conclusion that oil price hikes have a greater impact on GDP growth than oil price reductions, with the latter being statistically insignificant in the majority of cases. Additionally, it was discovered that oil price hikes among nations that import oil always have a detrimental effect on economic activity.

As a result of higher export revenues, oil exporting nations experience a direct increase in real national income when oil prices rise. Conversely, when oil prices fall, governments experience significant revenue shortfalls, rising unemployment, declining income and spending, a potential economic recession, and an increased risk of social unrest. According to studies by Mork (1989), an increase in oil prices had a significant negative impact on the growth of the US gross domestic product, whereas a fall in oil prices had no impact on economic growth.

METHODOLOGY

BRAZIL:

Brazil's average value during that time was 4.93 Brazilian Real, with lows of 4.79 Brazilian Real on October 10, 2022, and highs of 5.05 Brazilian Real on November 21, 2022. For contrast, 10.14 Brazilian Reals has been the global average price of gasoline throughout this time. To view the pricing in gallons, use the drop-down menu. The information for the nation and the other nations in our database is gathered from authoritative government sources, regulatory organisations, oil firms, and mass media outlets. Every week, we update the data.

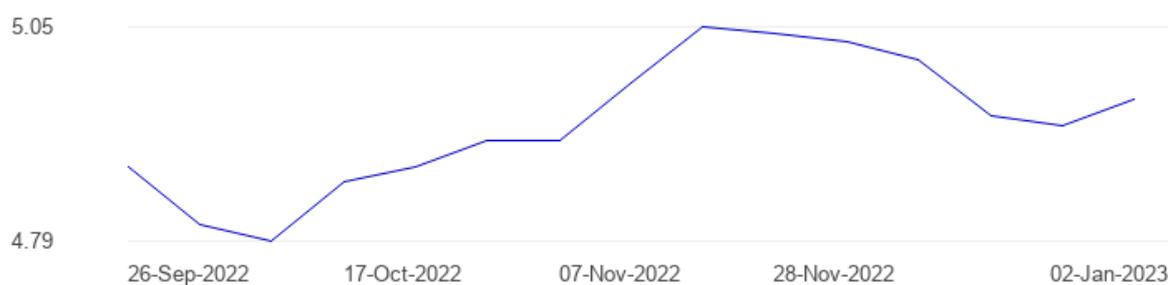
The process entails four steps. First, based on historical data, establish the level of gasoline costs for a specific level of crude oil prices by using time series on fuel prices, crude oil prices, and exchange rates. It is advisable to carry out the estimations using weekly data for greatest precision and at least three years of data to account for both high and low points in oil prices. Multiple regression analysis estimated at the level of each individual country is the statistical method.

First, STATA, R, Excel, or any other statistical tool can be used. To see whether these variables may reasonably be used to predict fuel costs, look at the R-squared of the regression. Any figure that is higher than around 0.85 is acceptable. In markets for liberalised fuels, such is typically the case.

Second, as described below, get the most recent projections for crude oil prices.

Third, calculate the level of fuel costs that would be charged if the forecasts for crude oil prices were to come true using the estimated parameters from your regression model. Play around with scenarios of rising and falling exchange rates as well as rising and falling crude oil prices.

Fourth, make the analysis more difficult. By using the key variables' logarithms or by modifying the right-side variables, re estimate your model and forecasts. Attempt to eliminate outliers. See if there is a difference when the weekly data are combined with the monthly observations. To assess the model's ability to anticipate outcomes, calculate out-of-sample predictions. See how the model performs when crude oil prices are high and low. Include a time trend variable to track changes in taxation and the rising cost of fuel marketing and delivery over time. To record seasonal patterns, create and incorporate seasonal dummy variables.



RUSSIA:

Brazilian prices from 26 September 2022 to 2 January 2023. Brazil's average value during that time was 71.72 Russian Roubles, with lows of 69.66 Russian Roubles on October 10, 2022, and highs of 73.44 Russian Roubles on November 21, 2022. Then, 147.51 Russian Roubles is the global average price of gasoline at this time. To view the pricing in gallons, use the drop-down menu. The information for the nation and the other nations in our database is gathered from authoritative government sources, regulatory organisations, oil firms, and mass media outlets. Every week, we update the data.

The process entails four steps. First, based on historical data, establish the level of gasoline costs for a specific level of crude oil prices by using time series on fuel prices, crude oil prices, and exchange rates. It is advisable to carry out the estimations using weekly data for greatest precision and at least three years of data to account for both high and low points in oil prices. Multiple regression analysis estimated at the level of each individual country is the statistical method.

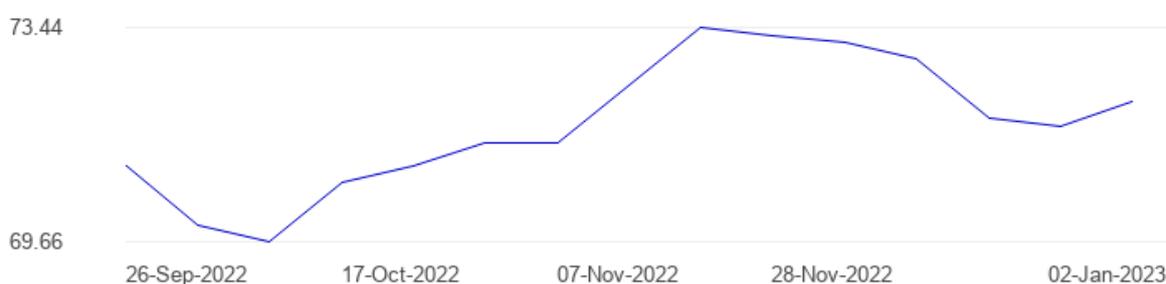
STATA, R, Excel, or any other statistical tool can be used. To see whether these variables may reasonably be used to predict fuel costs, look at the R-squared of the regression. Any figure that is higher than around 0.85 is acceptable. In markets for liberalised fuels, such is typically the case.

Second, as described below, get the most recent projections for crude oil prices.

Third, calculate the level of fuel costs that would be charged if the forecasts for crude oil prices were to come true using the estimated parameters from your regression model. Play around with scenarios of rising and falling exchange rates as well as rising and falling crude oil prices.

Fourth, make the analysis more difficult. By using the key variables' logarithms or by modifying the right-side variables, reestimate your model and forecasts. Attempt to eliminate outliers. See if there is a difference when the weekly data are combined with the monthly observations. To assess the model's ability to anticipate outcomes, calculate out-of-sample predictions. See how the model performs when crude oil prices are high and low. Include a time trend variable to track changes in taxation and the rising cost of fuel marketing and delivery over time. To record seasonal patterns, create and incorporate seasonal dummy variables.

If you follow the advice given above, you will gain a thorough grasp of how fuel prices behave in a given nation and be able to judge the accuracy of forecasts.



INDIA:

Brazil's average value during that time was 76.05 Indian Rupee, with lows of 73.86 Indian Rupee on October 10, 2022, and highs of 77.86 Indian Rupee on November 21, 2022. For comparison, 156.41 Indian Rupee is the global average price for gasoline during this time. To view the pricing in gallons, use the drop-down menu. The information for the nation and the other nations in our database is gathered from authoritative government sources, regulatory organisations, oil firms, and mass media outlets. Every week, we update the data.

The process entails four steps. First, based on historical data, establish the level of gasoline costs for a specific level of crude oil prices by using time series on fuel prices, crude oil prices, and exchange rates. It is advisable to carry out the estimations using weekly data for greatest precision and at least three years of data to account for both high and low points in oil prices. Multiple regression analysis estimated at the level of each individual country is the statistical method.

STATA, R, Excel, or any other statistical tool can be used. To see whether these variables may reasonably be used to predict fuel costs, look at the R-squared of the regression. Any figure that is higher than around 0.85 is acceptable. In markets for liberalised fuels, such is typically the case.

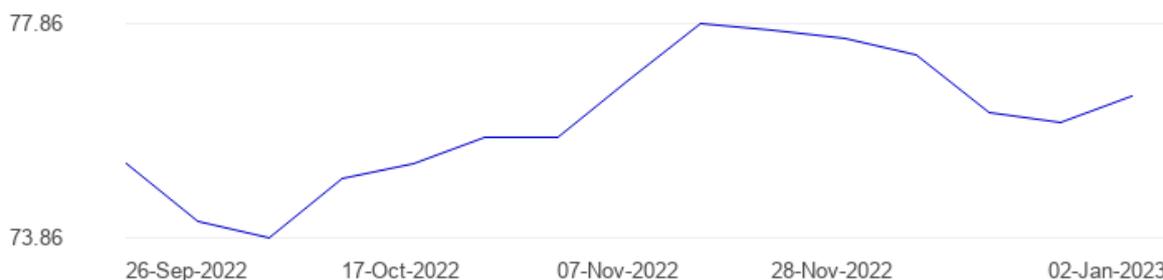
Second, as described below, get the most recent projections for crude oil prices.

Third, calculate the level of fuel costs that would be charged if the forecasts for crude oil prices were to come true using the estimated parameters from your regression model. Play around with scenarios of rising and falling exchange rates as well as rising and falling crude oil prices.

Fourth, make the analysis more difficult. By using the key variables' logarithms or by modifying the right-side variables, reestimate your model and forecasts. Attempt to eliminate outliers. See if there is a difference when the weekly data are combined with the monthly observations. To assess the model's ability to anticipate outcomes, calculate out-of-sample predictions. See how the model performs when crude oil prices are high and

low. Include a time trend variable to track changes in taxation and the rising cost of fuel marketing and delivery over time. To record seasonal patterns, create and incorporate seasonal dummy variables.

If you follow the advice given above, you will gain a thorough grasp of how fuel prices behave in a given nation and be able to judge the accuracy of forecasts.



CHINA:

Brazil's average value throughout that time was 6.34 Chinese Renminbi, with lows of 6.16 and highs of 6.50 on October 10 and November 21, 2022, respectively. For comparison, 13.05 Chinese Renminbi is the global average price of gasoline at this time. To view the pricing in gallons, use the drop-down menu. The information for the nation and the other nations in our database is gathered from authoritative government sources, regulatory organisations, oil firms, and mass media outlets. Every week, we update the data.

The process entails four steps. First, based on historical data, establish the level of gasoline costs for a specific level of crude oil prices by using time series on fuel prices, crude oil prices, and exchange rates. It is advisable to carry out the estimations using weekly data for greatest precision and at least three years of data to account for both high and low points in oil prices. Multiple regression analysis estimated at the level of each individual country is the statistical method.

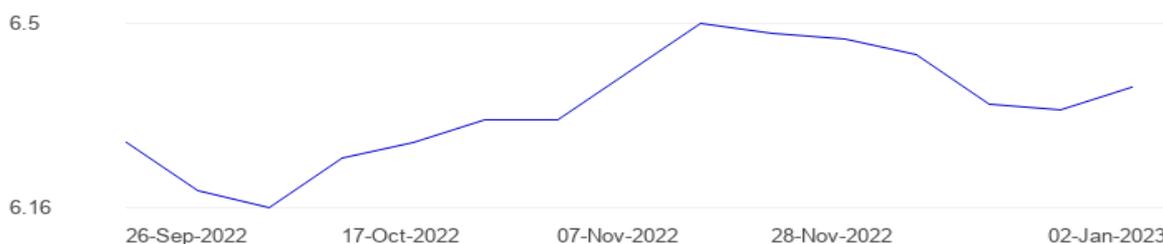
STATA, R, Excel, or any other statistical tool can be used. To see whether these variables may reasonably be used to predict fuel costs, look at the R-squared of the regression. Any figure that is higher than around 0.85 is acceptable. In markets for liberalised fuels, such is typically the case.

Second, as described below, get the most recent projections for crude oil prices.

Third, calculate the level of fuel costs that would be charged if the forecasts for crude oil prices were to come true using the estimated parameters from your regression model. Play around with scenarios of rising and falling exchange rates as well as rising and falling crude oil prices.

Fourth, make the analysis more difficult. By using the key variables' logarithms or by modifying the right-side variables, re estimate your model and forecasts. Attempt to eliminate outliers. See if there is a difference when the weekly data are combined with the monthly observations. To assess the model's ability to anticipate outcomes, calculate out-of-sample predictions. See how the model performs when crude oil prices are high and low. Include a time trend variable to track changes in taxation and the rising cost of fuel marketing and delivery over time. To record seasonal patterns, create and incorporate seasonal dummy variables.

If you follow the advice given above, you will gain a thorough grasp of how fuel prices behave in a given nation and be able to judge the accuracy of forecasts.



CONCLUSION:

The four greatest rapidly developing emerging economies—Brazil, Russia, India, and China—collectively known as the BRIC countries—and their respective GDPs are examined in this study utilising an empirical analysis and a sample of observations from 1987 to 2014. Testing the normality of time series is the first stage in the empirical study. The test statistic demonstrates that the GDP and Oil Price have a normal distribution with values of 5.557324 and 4.523575, respectively, which do not exceed the critical value at a significance level of 5% (5.99).

Brazil's average value during that time was 4.93 Brazilian Real, with lows of 4.79 Brazilian Real on October 10, 2022, and highs of 5.05 Brazilian Real on November 21, 2022. For contrast, 10.14 Brazilian Reals has been the global average price of gasoline throughout this time. To view the pricing in gallons, use the drop-down menu. The information for the nation and the other nations in our database is gathered from authoritative government sources, regulatory organisations, oil firms, and mass media outlets. In the graph, the curves goes up and down which shows the cost of the oil goes increases from we taken it as 2022-23.

Brazilian prices from 26 September 2022 to 2 January 2023. Brazil's average value during that time was 71.72 Russian Roubles, with lows of 69.66 Russian Roubles on October 10, 2022, and highs of 73.44 Russian Roubles on November 21, 2022, Then 147.51 Russian Roubles is the global average price of gasoline at this time. In the graph, the curves first goes down due to the Ukraine – Russia war and then it goes increases. Slightly decreases but when compared to 2022 its increases and the graph which shows the cost of the oil goes increases from we taken it as 2022-23.

Brazil's average value during that time was 76.05 Indian Rupee, with lows of 73.86 Indian Rupee on October 10, 2022, and highs of 77.86 Indian Rupee on November 21, 2022. For comparison, 156.41 Indian Rupee is the global average price for gasoline during this time. First, based on historical data, establish the level of gasoline costs for a specific level of crude oil prices by using time series on fuel prices, crude oil prices, and exchange rates. It is advisable to carry out the estimations using weekly data for greatest precision and at least three years of data to account for both high and low points in oil prices. Multiple regression analysis estimated at the level of each individual country is the statistical method.

Brazil's average value throughout that time was 6.34 Chinese Renminbi, with lows of 6.16 and highs of 6.50 on October 10 and November 21, 2022, respectively. For comparison, 13.05 Chinese Renminbi is the global average price of gasoline at this time. To view the pricing in gallons, use the drop-down menu. The information for the nation and the other nations in our database is gathered from authoritative government sources, regulatory organisations, oil firms, and mass media outlets. In the graph, the curves goes up and down which shows the cost of the oil goes increases from we taken it as 2022-23.

REFERENCES:

1. Ayadi, O.F., Chatterjee, A. and Obi, C.P. (2000). A Vector Autoregressive Analysis of an Oil Dependant Emerging Economy-Nigeria. *OPEC Review*, 24(4), 329-349.
2. Bjornland, H.L., Thorsrud, L.A. (2014). What is the effect of an oil price decrease on the Norwegian economy? Retrived from http://home.bi.no/a0310125/BT_OilPrice_2014.pdf.
3. Boroujerdian, S. (2007). A Study of the Impacts of Oil Price Shocks on Economic Growth. Unpublished Master's Dissertation submitted to the Faculty of Economics of Tehran University.
4. Burbidge, J. and Harrison, A. (1984). Testing for the effects of oil-price rises using vector auto regressions. *International Economic Review*, 25 (2), 459-484.
5. Christiano, L.J., Eichenbaum, M. S. and Trabandt, M. (2014). Stochastic Simulation of a Nonlinear, Dynamic Stochastic Model. Available at http://faculty.wcas.northwestern.edu/~lchrist/research/Great_Recession/analysis.pdf, Northwestern University.
6. Cologni, A. and Manera, M. (2009). The Asymmetric Effects of Oil Shocks on Output Growth: A MarkovSwitching Analysis for the G-7 Countries. *Economic Modelling*, 26, 1-29.

7. Devarajan, S. and Go, D.S. 'The 123PRSP Model' in Francois Bourguignon and Luis Pereira daSilva, The Impact of Economic Policies on Poverty and Income Distribution. Washington, DC: The World Bank and Oxford University Press, 2003.

8. Esfahani, H. S. and Mohaddes, K. and Pesaran, M. H. (2009). Oil Exports and the Iranian Economy. IZA Discussion Paper No. 4537. Available at SSRN: <http://ssrn.com/abstract=1501973>

9. Essama-Nssah, B. and Go, D. S. and Kearney, M. and Korman, V. and Robinson, S. and Thierfelder, K. (2007). Economy-Wide and Distributional Impacts of an Oil Price Shock on the South African Economy. World Bank Policy Research Working Paper No. 4354. Available at SSRN: <http://ssrn.com/abstract=1015667>

10. Finn, M. G. (2000). Perfect Competition and the Effects of Energy Price Increases on Economic Activity. Journal of Money, Credit, and Banking, 32(3), 400–416.

11. Ghalayini, L. (2011). The Interaction between Oil Price and Economic Growth. Middle Eastern Finance and Economics, 13, 127-142.

12. Semboja, H.H.H. (1994). The Effects of Energy Taxes on the Kenyan Economy. Energy Economics, 3, 205–215.