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# Investigating the impact of gas price shock on macroeconomic variables with an emphasis on the formation of the regional gas market: dynamic general equilibrium model approach

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**EXTENDED ABSTRACT SAMPLE FORMAT**

## INTRODUCTION

In recent decades, due to the importance of the environment and reducing the level of pollution caused by hydrocarbon sources, natural gas has been considered as a clean fuel, which, in case of technology development and creating grounds for its widespread use in Different economic sectors will be effective. Therefore, in this article, the determination of the regional structure of gas and its effect on macroeconomic variables for the three countries of Iran, Russia and Qatar have been investigated. In this regard, the investigated scenario, gas price increase for Iran, Qatar and Russia and its effect on economic variables for the years 2015-2030 were investigated. The results indicate that, with the formation of the regional gas market centered on the three countries of Iran, Qatar and Russia, economic growth will decrease over time, the general level of prices and also welfare will increase over time for the three countries. Therefore, according to the results, it can be said that economic growth for Iran will decrease over time and inflation will increase, which is due to the limited capacity and lack of capital and technology in this sector, and in the long term with paying attention to the removal of obstacles and restrictions will lead to an increase in well-being. Therefore, Iran's joining regional markets will be beneficial for Iran.

## METHODOLOGY

In this research, DCGE model and GTAP database were used to estimate and forecast the years 2015-2030.

The geographical scope of the study is the countries of Iran, Qatar and Russia. DCGE models are mathematical models that consist of systems of equations that describe the relationships between departments, factors and other relationships based on the Social Accounting Matrix (SAM). These models are organized for a country, a region, or for a number of countries that trade together, such as the Global Trade Analysis Project (GTAP) database. These models provide an image of an economy that examines the relationships between sectors and factors including households, government and economic enterprises between a country and other countries or other regions.

The specification of the research model is the explanation of the technology tree equations, here are the main equations estimated in the research:

**Total production nest equations**

$$qva(j,r) + ava(j,r) = qo(j,r) - ao(j,r)$$

$$qf(i,j,r) + af(i,j,r) = qo(j,r) - ao(j,r)$$

To check the well-being in the GTAP model, it uses the EV criterion for regional well-being, which is calculated in a simulated way:

$$EV(r) - \left[u(r) * \frac{INC(r)}{100}\right] * [urATIO(r) * POPRATIO(r)] * [u(r) + POP(r)]$$

U(r)-indicates the rate of price change, $\left[u(r) * \frac{INC(r)}{100}\right]$ which is measured by the EV criterion by the welfare model of the entire region.

To check the economic growth for the change rate of domestic production, qgdp(r), whose equation is as follows:

qgdp(r)=vgdp(r)-pgdp(r)

vgdp(r) shows the value of domestic production in region r and pgdp(r) shows the price index. The solution of this equation shows the displacement of the production facilities curve with a constant rate of production factors, but for simulating the growth of primary resources, the value of qgdp(r) shows the growth measurement of that area.

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**FINDINGS**

In this research, at the beginning, the shock of gas price increase in the production function of the gas sector is obtained, which will lead to the redistribution of the production factors resulting from this change, and this effect through the chain connection mechanism of the variables will lead to the effect on the productivity coefficient. In the function of total production, welfare and change in the general level of prices.

As the results show, the effect of the gas price increase on the inflation of the three countries of Iran, Russia and Qatar has had a negative effect, and this effect will decrease in the future. Also, although the impact of gas price shock on the welfare level is different in these three countries, it can be concluded from the results of the model that all three countries will benefit from the flow of gas price changes towards improving economic welfare.

**CONCLUSION**

Also, the results of the model showed that the gas price shock had a negligible effect on the economic growth of these three countries; Apart from the fact that this issue shows the low sensitivity of the economic growth of these three countries to the price of gas, at the same time, it can be considered a sign of the resource curse in these three countries. Therefore, in general, the sensitivity that the three variables, inflation, prosperity and economic growth showed to the gas price shock in the three countries, is proof of the claim that the convergence of these three countries in line with decision-making policies in the field Gas can help the economy of these three countries as a whole, and this issue will be a support for the proposal for the formation of gas OPEC.

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