

## The impact of monetary policy instruments on sustainable development

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### KEYWORDS

cash flow  
economic growth per capita  
monetary policy instruments  
sustainable development

**ABSTRACT** In this research, the effect of monetary policy on five sustainable development indicators prepared by the United Nations was investigated in Iraq. For this purpose, variables of interest rate, exchange rate and volume of money in circulation have been used as monetary policy tools and the indicators have been used such as Proportion of the population living below the international poverty line (1.1.1), Proportion of population using safely managed drinking water (6.1.1.), Change in water-use efficiency (6.4.1), Renewable energy (7.2.1), share in the total final energy consumption, and Annual growth rate of real GDP per capita (8.1.1.). For this purpose, five regressions were estimated using the Two Stage Least Squares (2SLS) method. The results show that the exchange rate has a positive effect on indicators of poverty, efficient management of water resources, and economic growth per capita, and a negative effect on access to safe drinking water. Among other monetary policy instruments, only currency in circulation has a positive effect on poverty reduction, and in other cases it has no significant effect.

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### 1. INTRODUCTION

Sustainable development with the aim of reducing the burden on the environment and natural resources seeks to maintain and create economic growth. Due to the lack of natural resources and in order to preserve them for future generations, many countries have sought to achieve sustainable development during the past decades. This purpose is possible through applying and converging programs and strategies for economic growth and development with environmental protection and social development policies. One of the most important measures taken in the world to achieve sustainable development is the compilation of the Millennium Development Goals (MSGs) in 2000, which were not extended in 2015 due to various reasons, including the inharmonious progress of the Millennium Development Goals. Because its frameworks were limited to external issues, the lack of all stakeholders' involvement, especially in developing countries, and the lack of collective commitment. After that, in 2015, the Sustainable Development Goals (SDGs) replaced the MSGs, which had been adopted by the leaders of countries in the United Nations Sustainable Development Summit called River 20+. SDGs include 17 goals, 169 targets, and 231 indicators, which have three dimensions of sustainable development such as social, economic, and environmental sustainability. Iraq, like other countries, has implemented various policies to achieve sustainable development goals. One of the challenges of achieving sustainable development goals is the policies that

governments apply to achieve economic growth and development which may negatively affect the sustainability of the environment.

#### 1.1 The Statement of the Problem

Economic policies that handle trade-offs and foster synergy between various objectives are what decision-makers and stakeholders should ideally develop (Basheer et al, 2022). For instance, reducing poverty and promoting economic growth are two Goals that may have short-term tradeoffs with climate change mitigation and adaptation efforts, but these actions will likely have long-term positive effects on many SDGs (Al Mamun et al, 2014; Coondoo & Dinda, 2021).

Therefore, in order to achieve growth and development while preserving the environment, policymakers should consider all aspects of their applied policies. One of the important economic institutions is the Central Bank which can influence sustainable development with its policy makings. Central Bank is one of the most important pillars influencing the development path of countries by implementing monetary policies including controlling the interest rate, inflation rate, money supply, and exchange rate. Considering the goals and effects of the central bank's monetary policies that affect private household income, consumption levels, producer behavior, capital asset prices, etc., it can also indirectly affect the pressure on the environment and natural resources. However, exploring their relationship has been ignored in economic studies.

## 1.2 The Significance of Study

The monetary policy generally tries to control the volume of the money supply for the purpose of achieving certain economic goals. The monetary policy of the Central Bank is to reduce the money supply and increase the interest rate, in order to reduce the inflation rate, increase the national currency rate, or reduce the interest rate, by injecting liquidity into the economy to stimulate investment costs and economic activity in the country (Khalaf, 2021). In general, any policy related to the supply of money can be considered a type of monetary policy, because monetary policy is the process adopted by monetary authorities to influence the amount of money with the goal of achieving prices, total employment, and economic growth (Farhan et al, 2022). The exchange rate can be stabilized to achieve monetary stability, which will eventually reflect in price stability. Interest rates are another tool that central banks can employ to implement monetary policies. to influence the amount of accessible liquidity in the economy in order to close the gap between the monetary current and the real one and to ensure overall economic stability (Farhan et al, 2022). One method the central bank uses to accomplish a rise or decrease in the number of cash reserves with commercial banks and the general public is open market operations, which has an impact on the amount of credit extended by these banks.

Iraq, like other countries, has taken various measures to achieve the goals of sustainable development, but due to the weakness of the institutions, the lack of coherent and classified statistics has made it difficult to calculate and measure the SDGs in this country (Hussain, 2020). The Central Bureau of Statistics of Iraq, in cooperation with the United Nations, has only collected information on 62 indicators out of all the written indicators of the 2030 Iraqi Development Document. Among them, the Central Bureau of Statistics has developed 33 indicators while the UN has compiled 29 indicators. Energy and renewable energy-related SDGs are among those with many restrictions on data collection, therefore it is highly challenging to get the right statistics for these goals.

Despite all of the issues facing Iraq, the 2030 SDGs version for Iraq is built on the principles of promoting sustainable development dimensions, empowering the Iraqi people to build a safe and united nation where everyone has equal rights, establishing an economic system with diversified social market orientations and stable macroeconomic indexes, and creating a clean, safe, and sustainable environment for both the present and the future.

## 1.3 The Purpose of the Study

The aim of this paper is to investigate the impact of monetary policies in Iraq on five SDG goals. Regarding the available information and based on the research purpose, desired indicators that have been selected for this study including Goal.1 (1.1.1: Proportion of the population living below the international poverty line by sex, age, employment status, and geographic location), Goal.6 (6.1.1: Proportion of population using safely managed to drink water services, 6.4.1: Change in water-use efficiency over time), Goal.7 (7.2.1: Renewable energy share in the total final energy consumption) and Goal.8 (8.1.1: Annual growth rate of real GDP per capita) which each one of them represents respectively Goal.1 indicates Poverty, Goal. 6 shows Clean

water and sanitation, Goal.7 means Clean energy and Goal.8 represents economic growth.

## 2. LITERATURE REVIEW

Although there have been many studies on the effects of monetary policies on the economy, the studies that have evaluated the effects of monetary policies on sustainable development indicators are very limited. Razika and Karima (2018) investigated the effect of applying monetary policies on achieving the goals of sustainable development in Al Jazeera, and the research results showed that in the period of 2015-2000, despite the application of various monetary policies, indicators of sustainable development, including the number of Internet subscribers, agricultural land, GDP per capita has increased and the unemployment rate has decreased (Mohaisen et al, 2023).

(Basheer et al, 2022) investigated the effect of consolidated policies in achieving sustainable development goals in Egypt. The results of their research showed that applying different economic, social, and political policies and creating a balance between them will improve SDG indicators, including reducing inequality, economic growth, and climate change mitigation. (Mathias & Yusuf, 2022) reviewed monetary policies and sustainable development goals in Nigeria. They showed that achieving sustainable development depends on creating economic growth. Therefore, they investigated the effect of monetary policy on economic growth. The results showed that in the long term, there is a positive relationship between economic growth and the supply of money and domestic credits. Also, there is a negative relationship between economic growth and short-term policy interest rates. Oguntuase (2020) examined the relationship between monetary policy of central banks in Africa and sustainable development. According to the type of behavior of banks, countries were divided into three groups of countries consisting of central banks with explicit, implicit and without sustainable development mandates. The findings of the research showed that in order to achieve sustainable development, the central bank should use radical and proactive policies. (Kiesel'akova et al, 2020) investigated the effect of monetary policy on the sustainable development of financial markets and ultimately economic growth for countries in the European region. The study's findings demonstrated that the asset purchase program, which is a part of monetary policy, had a favorable and stimulating impact on the growth of the goods and services markets as well as the labor market. In reality, this relationship is related to long-term financial development. (Altunyan et al, 2020) investigated the effect of economic policy instruments on the growth conditions of sustainable development in Russia. They suggested that in order to achieve sustainable development and create social sustainability, the problem of equitable distribution should be solved through the application of financial policies. Also, the central bank should reduce interest rates, increase the money supply through the issue of securities, and increase the expenses of the government to invest in education and health sections. (Ahmed & Karbit, 2022) investigated the challenges and remedies of sustainable development in Iraq and suggested that the most important action to achieve sustainable development is through development in human and the next generation should be informed about the benefits of using natural resources properly. (Ameen, 2020)

investigated people's awareness of the dimensions of sustainable development in Iraq. The results of the research showed that people are relatively aware of the aspects of sustainable urban development and are willing to live in sustainable cities. On the other hand, the results showed the very low quality of drinking water and the lack of efficient use of renewable energy. (Orji et al, 2022) examined the relationship between monetary policies and sustainable development in the ECOWAS region. Their results showed that the application of inflation targeting monetary policies on the creation of growth and added value in the agricultural sector is heterogeneous and inflexible, and in the industry and service sectors it is negative and homogeneous. Also, monetary policy has a symmetrical and homogeneous effect on sustainable economic growth. Qingquan et al., (2020) investigated the effect of monetary policy implementation on sustainable development air pollution indicators in Asian countries. The research results showed that expansionary monetary policy has a positive and long-term relationship with CO2 emissions. Boneva et al (2021) investigated the effect of the central bank's monetary policies on the sustainable development climate change indicator.

### 3. METHOD

In this research, the period 2002–2019 has been selected according to the available information to investigate the effect of monetary policies on sustainable development indicators in Iraq. The monetary policy tools that have been selected include interest rate, currency in circulation, and exchange rate, also the control variables of the inflation rate and foreign trade share of GDP have been added to the model. All information related to monetary policy variables and control variables was collected from the World Bank website, as well as sustainable development indicators from the United Nations website. Therefore, the research model can be written as follows:

$$SDG_i = \alpha_i + \beta_i MP_i + \gamma_i CV_i + \epsilon_i$$

### 4. RESULTS AND DISCUSSION

#### 4.1 Estimation, Model, and Analysis of Results

The estimation results of the first model are shown in Table 1. Based on the results, the model shows 95% of the changes related to poverty, and according to the F-static statistic = 81.94, the estimated model is completely significant. According to the results, liquidity and exchange rate have a positive effect on poverty. In fact, the elasticity of poverty with respect to liquidity is 0.012, meaning that a one percent increase in money in circulation increases the proportion of people living below the poverty line by 0.012%. The elasticity of poverty with respect to the exchange rate is equal to 0.05 and it states that a one percent increase in the exchange rate increases poverty by 0.05%. In fact, with the increase in liquidity and the decrease in the value of the national currency, the purchasing power of the people decreases and the number of poor people in the society increases. The trade volume variable has a negative and significant relationship with poverty. The elasticity of poverty trade with respect to trade is equal to 0.35 and shows that with a one percent increase in the volume of trade, the number of people living under the risk of poverty decreases by 0.35%. The reason for this issue can be mentioned that ac-

ording to the theories of international trade, foreign trade always adds to people's well-being, and one of its effects is reducing the number of people under the risk of poverty.

Based on the results of the model, it shows 60% of the changes related to the consumption of healthy drinking water, and according to the F-static statistic = 7.39, the estimated model is quite significant. According to the results, the exchange rate has a negative effect on the proportion of people who use safe drinking water. The elasticity of people's access to drinking water compared to the exchange rate is -0.44, which means that a one percent increase in the exchange rate decreases the access to drinking water by 0.44%. Other monetary policy tools have no effect on sustainable development indicator 6.1.1. Among the control variables, the inflation rate has a negative effect on the availability and use of safe drinking water with a coefficient of -4.43, and it shows that each percentage increase in inflation reduces the consumption of safe drinking water by 4.43%.

In fact, providing access to safe drinking water requires investment and providing related infrastructure, which increases the investment costs with the increase in exchange rate and inflation and has a negative effect on the provision of safe drinking water.

Based on the results of the model, it shows 95% of the changes related to the correct management of water resources, and according to the F-static statistic = 32.59, the estimated model is quite significant. Based on the results, the exchange rate has a positive effect on the correct management of water resources. The exchange rate elasticity coefficient is equal to 6.92, which means that a one percent increase in the exchange rate causes a 6.92 percent improvement in water resources management.

In fact, with the increase of the exchange rate in order to prevent the increase and save the costs related to the management of water resources, the management of these resources is improved. Both control variables included in the model have a significant effect on water resources management. Trade volume has a negative effect on water resources management and inflation has a positive effect. The elasticity of water resources management compared to trade and inflation is equal to -0.097 and 0.06, respectively, which shows that with a one percent increase in the share of foreign trade compared to GDP, water resources management increases by 0.97%, which can be due to the diffusion of water-saving technologies and the reformation of industry composition (Ahmed & Karbit, 2022)(Kagohashi, 2015). And with a one percent increase in the inflation rate, water resources management improves by 0.06%, which can be attributed to the effect of these two variables on water resources management costs. An increase in foreign trade causes an increase in foreign exchange earnings and a decrease in the exchange rate, and as a result, a decrease in water resources management costs, and an increase in inflation causes an increase in management costs in the water sector.

Based on the results of the model, it shows 58% of the changes related to the use of renewable energy and according to the F-static statistic = 5.78, the estimated model is quite significant. Based on the results, none of the monetary policy variables affect the amount of renewable energy use, but the control variables have a significant effect on those two. Like the research of (Zhang et al, 2021), the elasticity of the share of renewable energy consumption

with respect to foreign trade is positive and is equal to 0.41, which shows that a one percent increase in foreign trade causes a 0.41% increase in the use of renewable energy. The reason for this can be mentioned that the increase in foreign trade increases the possibility of importing capital and intermediate goods related to renewable energies and the conditions for the use of renewable energies increase. The elasticity of renewable energy use compared to inflation is -0.3, which shows that with a one percent increase in inflation, the share of renewable energy use will decrease by 0.3%. Since renewable energies are very nascent and have not been exploited on a large scale, therefore, the increase in inflation increases their exploitation costs and their use decreases.

Based on the results of the model, it shows 50% of the changes related to the growth of GDP per capita, and according to the F-static statistic=4.07, the estimated model is completely significant. According to the results, the exchange rate has a positive effect on GDP per capita growth. There are different views on how the exchange rate affects economic growth, which can generally be said that the increase in the exchange rate is due to the decrease in the value of the national currency and the increase in exports (Karahan, 2020). As well as, exerting pressure on efficiency improvement and technological progress via workers' motivation, education and capital intensity increase economic growth (Ping, 2011). But if the exchange rate exceeds a certain threshold value, its further increase will have a negative effect on economic growth. In this model, the elasticity of economic growth per capita with respect to the exchange rate is 0.99, which means that a one percent increase in the exchange rate increases economic growth by 0.99%.

Both control variables included in the model affect economic growth. The share of foreign trade in relation to GDP has a positive effect on economic growth, which is in accordance with the research of (Hallaert, 2010) Abedin (2021), and its estimated coefficient is equal to 3.63, which shows that with a one percent increase in foreign trade, economic growth is 3.63% increase. Inflation rate also has a negative effect on economic growth per capita and it shows that each one percent increase in inflation reduces the consumption of economic growth by 2.43%. I

n fact, the increase in inflation causes a decrease in economic growth by increasing investment costs and decreasing investment efficiency (Ahmed & Karbit, 2022)(Nazari & Barzegar, 2011).

#### 4.2 Discussion

Sustainable development is one of the economic terms and is the meeting point of society, economy and environment. Sustainable development is a combination of two words that unites two different aspects of economic, industrial progress and environmental quality in one symbol of sustainable development. The sustainable development always includes the following topics in its discussions: the interconnection of the environment and economic development; Paying attention to the people as the axis of development and efforts to establish areas of participation; Paying attention to meeting the basic and basic needs of the people; attention to internal development within the framework of natural resource limitations; Helping the poor and destitute and trying to achieve social justice and trying to establish economic justice has been emphasized. One of

the characteristics of sustainable development is the development of environmental health and flexibility. The importance of people in achieving sustainable development and paying attention to people as the focus of development and efforts to establish areas of participation; Paying attention to the people and meeting their basic and basic needs, including suitable housing, health and suitable technology for everyone; attention to internal development within the framework of natural resource limitations; Helping the poor and destitute; Because there is no other way for this group to destroy and pollute the environment; Trying to achieve social justice and equality within and between generations and trying to establish economic justice.

The first hypothesis is accepted. The exchange rate and the currency in circulation (liquidity) has the positive impact on increasing the poverty. The second hypothesis as accepted. The exchange rate negatively affects the access to drinking water The third hypothesis is accepted. The results indicate the positive impact of exchange rate on water-use efficiency. The results of the fourth model indicate that none of the monetary policy tools affect the renewable energy consumption, while the control variables, foreign trade positively and inflation negatively affect it. The fifth hypothesis is accepted and the exchange rate positively affect the real growth of GDP per capita. Finally, it can be said that the interest rate has no effect on SDG goals. Generally, the exchange rate has a positive effect on indicators of poverty, efficient management of water resources, and economic growth per capita, and a negative effect on access to safe drinking water. Among other monetary policy instruments, only currency in circulation has a positive effect on poverty reduction, and in other cases it has no significant effect. Therefore, in sustainable educational development, it is through direct and active participation, relying on a holistic approach. The components of such development must be understood and communicated as specific and identifiable entities. On the one hand, this training should include policy makers, decision makers, planners, designers, and implementers, and on the other hand, it should include those who realize development, i.e. the people. Considering the results, in order to achieve the SDG goals, the management of the exchange rate depreciation is recommended since it has the negative impact on sustainable development goals. The contractionary monetary policies are recommended to avoid the growth of the number of the population below the poverty line.

#### 5. CONCLUSION

The results of the research indicate a long-term balance between certain indicators of sustainable development and economic growth in Iraq during the duration of the study. This demonstrates the research hypothesis, Many economic, social and environmental indicators that show low growth rates excluding per capita GDP decreased during the duration of the study, Through the implementation of sustainable development indicators to Iraq, Iraq has the capacity to achieve sustainable development by expanding welfare investments such as those from infrastructure, education and health, The results of the study showed a long-term balance between some indicators of sustainable development and economic growth in Iraq during the duration of the study, because the wrong correction parameter is negative and moral at a lower level (1%). The parameter indicates

a return to balance during (0.002) of time, i.e., changes in sustainable development indicators lead to changes in economic development indicators.

## 6. ACKNOWLEDGEMENT

Thank you to Presidency of Mustansiriyah University, Iraqi University, College of Administration and Economics, Iraq and Ma'arif Lampung University (Umala) for the support in this study.

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