Al-Qadisiyah Journal for Administrative and Economic Sciences ISSN$_{Online}$: 2312-9883
QJAE, Volume 27, Issue 2 (2025) ISSN$_{Print}$: 1816-9171
DOI: https:// doi.org/ 10.33916/ qjae.2025 .02148167

Measuring and Analyzing the Impact of Fiscal Discipline on the Economic Growth Rate in Iraq for the Period (2003–2022)

Amal Asmar Zaboon Mohammed Sabah Hassan
Amel.zaboon@qu.edu.iq ma1531351@gmail.com
University of Al-Qadisiyah

Received: 6/4/2025
Accepted: 18/5/2025
Available online: 15 /6 /2025

Corresponding Author : Mohammed Sabah Hassan

Abstract : The research aims to measure and analyze the consequences of applying fiscal discipline policy on economic growth in Iraq by presenting and analyzing the changes and developments in the application of fiscal rules, followed by measuring their effect on economic growth. To achieve the research objectives, the descriptive-analytical method and econometric tools were used through the Vector Error Correction Model (VECM). One of the main findings is that both the budget balance rule and the golden rule had a negative effect on economic growth in Iraq, whereas the public expenditure rule and the public debt rule showed a positive effect. This could be due to the government focusing on financial balance, prioritizing budget stability over projects that support sustainable development, or due to directing funds toward infrastructure projects that Iraq urgently needs, limiting investments in sectors that promote higher economic growth rates.

Keywords: Fiscal Discipline, Economic Growth, Budget Deficit, Public Expenditure, Public Debt, Golden Rule, Iraq, GDP, Cointegration, VECM Model

INTRODUCTION: Achieving economic balance and stability is a general goal for all countries, and this is accomplished through the optimal utilization of available resources, especially financial ones. Economic growth is one of the essential components contributing to macroeconomic stability. Therefore, fiscal discipline policy holds great importance as one of the tools aiding fiscal policy in addressing deficits, reducing debt accumulation, and directing surpluses toward investment, thereby promoting economic growth.

In Iraq, the economy is characterized by clear structural imbalances due to its heavy reliance on crude oil, with oil revenues accounting for 95% of total public revenues. This indicates the weak contribution of other economic sectors. Consequently, fiscal policy, through its tools, including fiscal discipline, seeks to achieve economic growth.

Research Importance: The importance of this research lies in the fact that adopting a disciplined fiscal policy, by controlling the growth rate of public expenditures in line with the growth rate of public revenues, is necessary to avoid the negative effects of expansionary fiscal policy. It also contributes to preventing waste of available economic resources and achieving economic stability, which reflects positively on the growth rate and reduces the severity of economic shocks, especially for oil-dependent economies like Iraq.

Research Objectives:

1. To identify the concept of fiscal discipline and its measurement indicators.
2. To analyze the current situation and pathways of fiscal discipline policy and economic growth in Iraq and clarify the key roles that fiscal discipline plays in influencing economic growth.
3. To determine the impact of fiscal discipline policy on economic growth in Iraq through the application of the VECM model.

Research Problem:

Iraq is one of the countries suffering from the mismanagement of its available financial resources, especially during times of financial abundance which often result from oil revenues, along with weak contributions from other economic activities. Thus, the research problem is based on the following questions: Does adopting a fiscal discipline policy in Iraq positively affect economic growth? Are there obstacles to implementing this policy in Iraq?

Research Hypothesis:

This research is based on the fundamental hypothesis that applying a fiscal discipline policy in Iraq will have a positive effect on economic growth if the obstacles to implementing this policy are removed.

Research Methodology: To achieve the intended objectives, the researcher adopted the deductive approach in reviewing the conceptual framework and used the inductive approach through descriptive and analytical methods to present and analyze data related to fiscal rules and economic growth in Iraq, drawing on official and international reports available on the subject. The quantitative method was applied using the Vector Error Correction Model (VECM) to measure the effects of applying fiscal discipline on economic growth in Iraq.
Time and Spatial Limits: Time Limit: The period (2003–2022) Spatial Limit: Iraq

One: Theoretical and Conceptual Framework of Fiscal Discipline and Economic Growth

First: Fiscal Discipline (Concept, Importance, Objectives, and Financial Rules to Achieve It)

1. Concept of Fiscal Discipline: The term "fiscal discipline" has been widely used in economic circles(Petrol & Tags, 2017, p. 13), even though there is no universally agreed-upon definition by fiscal policy institutions or academia. However, the economic literature includes several definitions (Hov, 2003, p. 3). One defines fiscal discipline as the process of managing public spending rationally and accurately to achieve financial and economic objectives in accordance with state budget indicators and within medium and long-term economic plans and programs (Save, 2013, p. 26) . Accordingly, fiscal discipline policy requires strengthening and activating mechanisms of oversight and accountability over executive bodies and institutions to monitor the allocated financial resources and their efficient use (Ali, 2011, p. 12).

Others view fiscal discipline as a process that enhances the efficiency of financial operations and maintains their soundness over long periods. According to Huber du Volban, fiscal discipline is a set of procedures and reforms in financial management that contribute to achieving dynamic equilibrium in the national economy. Some define it as the process of achieving a balance between total government expenditures and allocations specified in the state budget. In other words, it refers to a mechanism aimed at preventing public expenditures from exceeding allocated amounts or limiting the budget deficit to a certain percentage of GDP. This implies adopting a mechanism for estimating public spending based on the actual needs of economic units and the available financial capabilities within the state.

Thus, fiscal discipline does not necessarily imply austerity but refers to the process of controlling the rate of government spending within certain limits to ensure the enhancement of economic activity and the achievement of targeted growth rates.

It is worth noting that the degree of fiscal discipline is among the most important indicators for measuring economic stability and the efficiency and effectiveness of institutions specialized in preparing and implementing public budgets (Mohammed & Hamid, 2019, p. 5).

2. Importance of Fiscal Discipline: The importance of fiscal discipline lies in achieving economic stability and enhancing long-term growth rates in the national economy by implementing sound financial management policies, maintaining a balanced budget, reducing government debt, ensuring transparency and accountability, and curbing deficits (Abdullah, 2023, p. 492). It also contributes to achieving budget surpluses, considered a form of savings, and helps contain deficits without resorting to tax increases, which could negatively impact the national economy (Hemming, 2011, pp. 3–4).

As fiscal discipline refers to not exceeding total government spending beyond the allocations in the general budget and not allowing the financial deficit to surpass a certain percentage of GDP, it gains importance in how expenditures are directed within budget constraints. Applying fiscal discipline is a preferable solution for addressing economic crises, instead of resorting to austerity or tax hikes. Reducing public spending as a means to limit deficits poses political and social challenges (Al-Nuaimi, 2018, p. 562).

Moreover, fiscal discipline contributes to achieving financial stability, which refers to the financial sector's ability to cope with local and international crises and imbalances by efficiently utilizing financial resources whether for investment opportunities or operational payments in a timely manner. Its significance also lies in curbing behavioral biases in fiscal policy that generate increased and additional costs to the national economy (Abdullah, 2023, p. 493).

- Objectives of Fiscal Discipline: Fiscal discipline policy seeks to achieve several objectives, most notably:
- Maintaining financial stability, which directly contributes to macroeconomic balance and reducing financial risks.
- Achieving revenue-expenditure symmetry, ensuring a balance between public revenues and expenditures to protect citizens' interests (Tirole, 2014, p. 94).
- Enhancing the soundness of public financial operations by designing long-term budget plans that anticipate and mitigate potential risks.
- Reducing social and economic costs arising from financial crises, thus achieving financial sustainability and flexibility.
- Coping with economic cycle fluctuations and internal/external shocks by adapting government financial operations.
- Preserving national material and financial resources through efficient utilization.

- Addressing fiscal deficits and ensuring budget balance.
- Reforming the structure of taxation and public expenditure to balance the general budget structure.
- Predicting and addressing potential budgetary problems in advance to provide timely and effective solutions (Al-Juhaimi, 2019, pp. 27–28).

4. Types of Fiscal Rules to Achieve Fiscal Discipline:

A. General Revenue Rule:

This rule sets lower and upper limits on expected state revenues to reduce tax burden severity and enhance the collection of actual revenues as a percentage of GDP. However, it does not set a ceiling for public expenditures, thus not directly related to controlling public debt. This rule is cyclical in nature, leading to pro-cyclical fiscal policies during economic booms and recessions (Abdulaziz & Farhan, 2022, p. 202).

B. Budget Balance Rule:

According to the Maastricht Treaty (1992), the budget deficit should not exceed 3% of GDP. This rule emphasizes balancing revenues and expenditures, allowing deficits only under exceptional or emergency conditions. The budget balance rule plays a vital role in reducing deficits and lowering public debt (Hamad & Badowah, 2015, p. 80).

C. Public Expenditure Rule:

This rule aims to control state finances in alignment with fiscal discipline objectives, especially when combined with the budget balance and debt rules. It does not restrict revenue generation but limits expenditure growth (Alawi et al., 2018, p. 19). This rule does not hinder fiscal policy's role in achieving economic stability during shocks, as it does not require changes in revenue levels. It involves setting limits on current or total expenditures as a percentage of GDP or growth rates over a period (typically 3–5 years) (Abdulaziz & Farhan, 2022, p. 202). It helps curb rising public debt, especially when combined with other fiscal rules. In developing countries, it is often legislated to guide short- and medium-term policymaking (Cordes et al., 2015, p. 6).

D. Public Debt Rule:

This rule requires that public debt be maintained within a certain percentage of GDP, determined by various factors including national income, resource utilization, financial system nature, marginal capital efficiency, and consumption propensity. This rule is considered more effective and efficient than others in terms of monitoring and enforcement. It primarily aims to limit public debt to a ceiling of approximately 60% of GDP and permits temporary deficits, provided the reasons and timeframe for returning to balance are clear (Fata's & Iain, 2004, p. 49).

E. The Golden Rule:

This rule allows borrowing in line with economic cycles to finance public investments that strengthen infrastructure and promote growth, while operating expenditures are to be financed through current revenues and taxes. It emphasizes that private investment depends not only on capital and labor but also on the availability of essential services like communications, transportation, and electricity, which enhance overall productivity (Ali & Ahmed, 2018, p. 109).

Second: The Concept of Economic Growth

Economists generally agree that economic growth refers to the improvement and enhancement of individuals' living standards through an increase in their share of total national income. This is achieved when the growth of Gross Domestic Product (GDP) exceeds the population growth rate. However, if the population growth in a given country during a specific period matches the growth rate of GDP, this situation is not considered economic growth, but rather economic expansion.

On the other hand, genuine economic growth cannot be realized unless the rate of increase in monetary incomes surpasses the rate of inflation. Sustainable growth is achieved by aligning international economic regulations with existing national systems in a manner that ensures long-term and sustainable economic growth (Al-Hassan, 2011, p. 7).

It is also worth noting that economic growth is not an end in itself, but rather a means to achieve numerous objectives of significant importance to society. This is accomplished through its capacity to create and generate economic opportunities, which cannot be realized without continuous economic growth. Therefore, achieving sustainable economic growth requires the adoption of a set of policies ((Al-Saadi & Al-Awadi, 2021, p. 54) , including:

- Developing the labor market across various sectors.
- Promoting exports and adopting suitable strategies in the industrial sector, as well as localizing knowledge and technology.
- Improving existing consumption patterns and rationalizing the use of available resources.

Third: The Implications of Fiscal Discipline on Economic Growth

Economic growth is one of the primary objectives pursued by countries around the world, whether developed or developing. It refers to an increase in gross domestic product (GDP) in a way that ensures a rise in per capita output (Al-Janabi, 2015, p. 139). It is also defined as the increase in real income or production within a society over a specific period, at a rate that exceeds population growth. Economic growth can lead to increased capital accumulation and income levels, which in turn enhance the provision of goods and services to individuals, improve living standards, and promote overall economic welfare.

Various theories have addressed the determinants of economic growth. Classical economic thought, for instance, was based on several assumptions such as full employment, private ownership, and pure competition. Within this framework, opinions differed among thinkers regarding the mechanisms of economic growth. For example, Adam Smith emphasized labor as the source of a nation's wealth. Classical economists viewed production as a function of multiple inputs including capital, technological advancement, natural resources, and labor. Accordingly, changes in output are linked to variations in one or more of these factors (Al-Quraishi, 2007, p. 62).

One of the most notable models that emphasized the state's role in economic growth is Barro's model, which assumes that governmental activities are the main source of endogenous economic growth. Subsequent models highlighted the impact of public services on growth, such as the "public goods and productive government services" model, which posits a relationship between the size of government measured as public expenditure as a share of GDP and economic growth rates. In other words, government intervention in economic activity and the expansion of both consumption and investment expenditure can positively influence growth, as illustrated by Keynesian economics, which argues that increased government spending can help reduce unemployment by boosting aggregate demand.

Fiscal policy and programs aimed at achieving fiscal discipline play a central role in promoting economic growth. This is achieved through a variety of strategies, such as investing in infrastructure and offering tax incentives (Foster Capital, 2015,p.9.). According to the World Bank, infrastructure represents physical capital invested in public services such as telecommunications, transportation, electricity generation, water supply, airports, ports, and railways primarily to support private sector projects.

Economist David Aschauer conducted a study on the relationship between productivity and infrastructure investment in the U.S. economy during the period 1971–1985. His research focused on the impact of government spending on infrastructure and productivity. A comparison between the Japanese and American economies revealed that net public infrastructure investment as a percentage of GDP was 5.1% in Japan and only 0.3% in the U.S. During the same period, productivity growth averaged 3.1% annually in Japan compared to just 0.6% in the U.S. Aschauer concluded that reduced government spending on infrastructure was a key factor behind the decline in overall productivity growth in the U.S(Dagher, 2010, p. 116) .

Thus, infrastructure investment significantly contributes to raising economic growth rates by increasing aggregate demand for goods and public services. If the production system is sufficiently flexible, it can respond to increased demand, thereby reinforcing expenditure and growth a phenomenon described by Wagner's Law (Al-Husseini, 2016, pp. 51–52). It is important to note that expansionary fiscal policy, according to some economists, can have both positive and negative effects on economic growth. Economist Ram, for example, emphasized in his study that public expenditure has a significant and positive impact on growth rates. Similarly, Aschauer, one of the early economists to focus on the role of public spending in capital formation, affirmed that such expenditures positively affect economic growth. Nevertheless, the positive effect of public spending has limits. Some scholars argue that public spending can negatively influence growth, particularly when guided by the Keynesian model, which considers government spending an exogenous variable with short- and medium-term effects on GDP growth. Consequently, a reduction in public spending may directly and negatively impact aggregate demand and income levels, leading to fewer employment opportunities and ultimately slower growth. Furthermore, if increased spending is directed toward non-productive sectors, it will not significantly contribute to enhancing growth.

Public expenditure is a key component of the general budget, through which the government seeks to achieve several objectives such as stimulating economic growth, reducing unemployment, maintaining macroeconomic stability, and achieving development. Reducing certain categories of government spending is essential to implementing fiscal discipline programs (Salem, 2022, pp. 441–445) . Among the most significant components of public expenditure are government consumption expenditures, especially those that contribute to economic balance, stability, and growth. This requires the government to ensure efficiency in resource utilization and in public spending. Additionally, reducing government wage bills can improve employment opportunities and boost private sector hiring. Lower public

wages may also enhance labor productivity, especially given the competition between the public and private sectors, thereby contributing to long-term growth.

Regarding government support in the form of social services and subsidies, excessive public spending in this area may result in resource waste and inefficient allocation. Therefore, rationalizing social spending and reforming subsidy programs are essential for the success of fiscal discipline policies. On the other hand, contractionary fiscal policies such as reducing public spending or increasing taxescan directly impact economic growth. According to much of the economic literature, understanding the effects of contractionary fiscal policy on growth requires analyzing the various channels through which these effects are transmitted, whether directly or indirectly (Al-Husseini, 2016, pp. 69–70) .

Taxes, as one of the main tools of fiscal policy and a major source of government revenue, significantly affect economic growth. Policymakers must use them cautiously to ensure the success of fiscal discipline policies without adversely affecting macroeconomic variables. An imbalanced tax system may impact corporate profits and individual incomes, leading to undesirable consequences for national economic performance and growth rates by undermining incentives for investment and labor. Hence, tax reform through balancing tax rates and broadening the tax base is an integral part of fiscal discipline efforts.

Fiscal discipline can be achieved through two main tax channels: the introduction of new taxes and the shifting of the tax burden from income to consumption. Accordingly, fiscal discipline supports a range of objectives such as achieving financial stability, reducing income and wealth inequality, minimizing economic fluctuations and shocks, stabilizing prices, and enhancing economic growth.

While many economists agree that taxes may negatively affect national economic performance by influencing business investment decisions which in turn affect growth there is debate over whether these effects are temporary or permanent. Neoclassical growth theories suggest that taxes only affect per capita income and not growth rates, implying that long term tax policies do not influence economic growth (Salem, 2023, pp. 1105–1107) . From this perspective, the negative impact of increased taxes may reduce investment levels, affecting output and growth temporarily these are known as "transitional effects."

Conversely, endogenous growth theories argue that tax policies play a more prominent role in determining economic growth rates. These theories posit that both physical and human capital investments depend on economic policies, including taxation. Therefore, from this standpoint, tax policies affect output and growth rates in both the short and long term these are "permanent effects. (Al-Husseini, 2016, pp. 70–71)" Some economists consider fiscal discipline essential for achieving economic growth, while others argue that fiscal discipline may have a negative impact on growth. Based on this debate, the relationship between fiscal discipline and economic growth can be summarized as follows (Foster Capital, 2017.p 33.) :

1. **Fiscal discipline promotes long-term economic growth** by reducing reliance on public borrowing, which lowers interest rates and stimulates private investment.
2. **In the short term, fiscal discipline may negatively impact economic growth** due to reduced government spending, which can lead to lower aggregate demand and potentially economic stagnation.
3. **Fiscal discipline enhances investor confidence**, thereby encouraging increased investment and contributing to higher economic growth rates.
4. **Fiscal discipline helps mitigate economic crises** by aligning public spending with government revenues

Analyzing the Development of Iraq's Fiscal Position and Economic Growth during the Period (2003–2022)

First: Analyzing the Fiscal Situation and Principles of Fiscal Discipline in Iraq during the Period (2003–2022)

To meet the requirements of sustainable development, Iraq spends amounts that exceed the capacity of its general budget relative to Gross Domestic Product (GDP), particularly in the absence of development in the state's general revenues aside from those generated by crude oil (Al-Sheikh Razi & Hassan, 2013, p. 184). This has led to a persistent fiscal deficit in the state's general budget. Iraq requires substantial investment to rebuild its infrastructure, enhance public services, and improve the development of its available human resources(United Nations Development Programme in Iraq, 2021, p. 9).

The fiscal structure of government resources in Iraq is characterized by a fundamental imbalance, due to excessive dependence on oil revenues to finance the state budget, while neglecting other potential sources of income from non-oil sectors. In addition, the country suffers from weak tax and fee collection systems, owing to a narrow tax base, inefficient tax collection institutions, and a lack of transparency and integrity (Al-Haidari, 2009, pp. 92–97) .

Oil revenues in Iraq represent the cornerstone of economic stability and prosperity. Naturally, fluctuations in global oil prices and economic instability result in volatility in public revenues, often as a consequence of adopting undisciplined fiscal policies, which negatively impact financial stability. Oil revenues have contributed approximately 95% of total public revenues. However, the government failed to utilize periods of oil revenue surpluses effectively, such as through the establishment of a sovereign wealth fund to absorb economic shocks and preserve the rights of future

generations. As a result, Iraq has suffered significant financial losses due to the absence of disciplined fiscal policy (Faraj & Ali, 2019, p. 493) .

Despite the importance of sovereign wealth funds, they are not a complete solution to Iraq's economic challenges (Al-Shamkhi, 2021) . Rather, they serve as tools to protect and stabilize the economy through better public expenditure control and prevention of wasteful use of oil surpluses (Al-Asadi, 2021, p. 90). Accordingly, it is necessary to examine and analyze the principles of fiscal discipline in Iraq through the following :

1. Analysis of the Development in the Structure of Public Revenues in Iraq during the Period (2003–2022)

Public revenues are the primary and essential source for financing government expenditures aimed at meeting the basic needs and services of the population. Public revenues are typically categorized into mandatory revenues such as taxes and fines and non-mandatory revenues such as voluntary loans and fees. The focus here is on analyzing Iraq's public revenue structure, where oil revenues have contributed more than 95% of total public revenues(Ministry of Planning, Central Statistical Organization, 2009, p. 29) .

According to Table (1), Iraq's public revenues increased gradually between 2003 and 2008, largely due to the rise in oil exports. In 2003, total public revenues amounted to approximately 4,596.0 billion IQD, of which oil revenues contributed around 4,096.50 billion IQD, accounting for 89.13% of the total. Tax revenues stood at 76.50 billion IQD (1.67%), while other revenues contributed 423.0 billion IQD (9.20%).

This upward trend continued until 2008, driven by several factors, including the lifting of restrictions on Iraq's oil exports in 2004, a recovery in global oil markets, and rising oil prices. By 2008, total revenues reached 80,641.04 billion IQD, with oil revenues contributing 79,131.75 billion IQD (98.12%). Tax revenues amounted to 985.83 billion IQD, and other revenues to 523.46 billion IQD.

However, the global financial crisis and the sharp decline in oil prices at the end of 2008 led to a drop in total revenues to 55,243.52 billion IQD in 2009, marking a negative annual growth rate of -31.49% compared to 2008. Oil revenues were 51,719.05 billion IQD, while tax revenues increased to 3,334.80 billion IQD indicating a higher share of tax revenue in the overall structure and other revenues totaled 189.67 billion IQD.

Between 2010 and 2012, Iraq's public revenues continued to rise, from 70,178.22 billion IQD in 2010 to 119,817.22 billion IQD in 2012. Of this, oil revenues contributed 116,597.08 billion IQD (97.31%), tax revenues 2,633.36 billion IQD, and other revenues 586.78 billion IQD. During the period 2013–2016, a sharp decline in oil prices caused public revenues to fall significantly, with the lowest negative annual growth rate recorded in 2015 at -37.06%. This decline was not only due to falling oil prices but also to political instability, poor security conditions, and sabotage of oil facilities. In response, the Iraqi government sought to increase non-oil revenues by raising taxes and fees.

From 2017 to 2019, public revenues rose again due to improved political, economic, and security conditions, along with a significant increase in oil prices. Public revenues reached 77,335.9 billion IQD in 2017, 106,569.8 billion IQD in 2018, and 107,567.0 billion IQD in 2019. However, 2020 witnessed a sharp decline in public revenues to 63,199.7 billion IQD, with a negative annual growth rate of -41.24%. This was mainly due to the COVID-19 pandemic and the global drop in energy demand, which led to falling oil prices.

With the beginning of recovery in 2021 and rising oil prices, Iraq's public revenues increased significantly to 109,081.5 billion IQD. Oil revenues accounted for 95,270.3 billion IQD (87.33%), tax revenues for 4,536.24 billion IQD (4.15%), and other revenues for 9,274.96 billion IQD (8.50%). In 2022, total public revenues further increased to 161,697.4 billion IQD. This surge is attributed to the rise in oil prices in the first half of 2022 due to the Russia–Ukraine war, which pushed oil revenues to 153,623.3 billion IQD (95.00% of total revenues). Tax revenues were 3,911.4 billion IQD, while other revenues amounted to 4,162.7 billion IQD.

In conclusion, the analysis reveals a persistent dominance of oil revenues in Iraq's public revenue structure. Tax and other revenues have never exceeded 35% of total public Revenues during the study period.

Table (1)Development of the Structure of Public Revenues in Iraq for the Period (2003–2022)

The percentage of other revenues for general % revenues	Revenue The other One billion dinars	The percentage of tax revenues for public % revenues	Tax revenues One billion dinars	The percentage of oil revenues for public % revenues	Oil revenue One billion dinars	Public revenue growth % rate	Public revenues One billion dinars	Sunnah
8	7	6	5	4	3	2	1	
9.20	423.0	1.67	76.50	89.13	4096.50	- - -	4596.0	2003
0.61	202.01	0.49	159.64	98.90	32627.20	81.77	32988.85	2004
1.30	460.4	1.22	495.28	97.48	39480.06	22.57	40435.74	2005
3.40	1667.4	0.98	480.14	95.62	46908.04	21.31	49055.54	2006
0.73	404.26	2.54	1397.99	96.72	53162.59	12.04	54964.84	2007
0.64	523.46	1.24	985.83	98.12	79131.75	46.71	80641.04	2008
0.34	189.67	6.03	3334.80	93.62	51719.05	-31.49	55243.52	2009

2.60	1826.12	2.18	1532.43	95.21	66819.67	27.03	70178.22	2010
8.21	8933.6	1.63	1783.59	90.15	98090.2	55.04	108807.39	2011
0.40	586.78	2.19	2633.36	97.31	116597.08	10.11	119817.22	2012
0.18	213.0	2.52	2876.86	97.28	110677.54	-5.04	113767.40	2013
6.29	6652.31	1.78	1885.12	91.91	97072.41	-7.17	105609.84	2014
19.77	13142.62	3.03	2015.01	77.19	51312.62	-37.06	66470.25	2015
11.56	6280.32	7.09	3861.89	81.35	44267.06	-18.14	54409.27	2016
7.71	5965.73	8.15	6298.27	84.14	65071.9	42.13	77335.9	2017
4.93	5263.79	5.34	5686.21	89.73	95619.8	37.80	106569.8	2018
4.04	4336.16	3.73	4014.53	92.23	99216.31	0.93	107567.0	2019
6.39	4033.02	7.46	4718.18	86.15	54448.5	-41.24	63199.7	2020
8.50	9274.96	4.17	4536.24	87.33	95270.3	72.59	109081.5	2021
2.57	4162.7	32.4	3911.4	95.0	153623.3	48.23	161697.4	2022

Source / Prepared by the researcher based on:

- Central Bank of Iraq, Annual Economic Reports, Statistics and Research Department, Republic of Iraq, various issues.
- Columns (2, 4, 6, 8) are the work of the researcher.

2. Analysis of the Development in the Structure of Public Expenditures in Iraq during the Period (2003–2022)

Public expenditure is one of the key variables that influence aggregate demand. It also reflects the government's fiscal policy orientation and the objectives it aims to achieve. Accordingly, policymakers seek to structure public expenditure in a way that ensures the optimal provision of essential services and the achievement of development goals.

To understand the evolution of public spending and its components during the study period, we refer to Table (2), which illustrates the development of Iraq's public expenditure structure between 2003 and 2022. The data shows a significant overall increase in public spending, rising from 9,232.2 billion IQD in 2003 to 116,959.6 billion IQD in 2022 , In 2003, total public expenditure amounted to 9,232.2 billion IQD, of which 7,362.3 billion IQD was allocated to current expenditures and 1,869.9 billion IQD to investment expenditures. After 2003, the Iraqi government adopted an expansionary fiscal policy, significantly increasing public spending. In 2004, total expenditure surged to 32,117.0 billion IQD, including 29,102.8 billion IQD in current expenditures and 3,014.2 billion IQD in investment expenditures. However, in 2005, total public spending decreased to 26,375.20 billion IQD, registering a negative annual growth rate of -17.87% compared to 2004. From 2006 to 2013, Iraq witnessed a steady increase in public spending, rising from 38,806.7 billion IQD in 2006 to 119,128.0 billion IQD in 2013. During this period, the share of current expenditures ranged between 66.10% and 84.47%, while investment expenditures ranged between 15.53% and 33.90% , Between 2014 and 2022, Iraq's public expenditures experienced volatility, fluctuating due to changes in oil prices and economic conditions, as well as dual crises facing the economy. Negative annual growth rates were recorded in 2014, 2015, and 2016 due to the dual shocks of a severe security crisis triggered by the war against terrorist groups and an economic crisis caused by the collapse of oil prices. The steepest decline occurred in 2016, with a contraction of -47.30% , In contrast, the years 2017, 2018, and 2019 saw a recovery in public spending, coinciding with improvements in oil prices and increased oil revenues, which remain the main source of funding for Iraq's federal budget. Public spending rose to 75,490.7 billion IQD in 2017, 80,872.9 billion IQD in 2018, and 111,723.5 billion IQD in 2019 , In 2020, the COVID-19 pandemic and the resulting global economic slowdown led to a sharp drop in oil demand and prices. Consequently, Iraq's public revenues declined significantly, leading to a decrease in both current and investment expenditures. Public spending fell to 76,082.4 billion IQD, marking a negative annual growth rate of -31.90% compared to 2019. In 2021 and 2022, public expenditure increased substantially to 102,849.4 billion IQD and 116,959.6 billion IQD, respectively. Current expenditures amounted to 89,526.7 billion IQD in 2021 and 104,941.1 billion IQD in 2022, while investment expenditures were 13,322.7 billion IQD and 12,018.5 billion IQD, respectively. This growth was largely driven by the recovery in oil prices, which boosted public revenues primarily composed of crude oil income—and enabled higher public spending to meet Iraq's social, administrative, and economic needs. These increases also reflected the global economic and political shifts and rising prices of goods and services.

Table (2)Development of the Structure of Public Expenditures in Iraq for the Period (2003–2022)

The percentage of investment expenditures to public % % expenditures	Investment expenditures One billion dinars	The percentage of current expenditures to % general expenditures %	Running expenses One billion dinars	Public expenditures growth rate %	Public expenditures One billion dinars	Years
6	5	4	3	2	1	
20.05	1869.9	79.95	7362.3	- - -	9232.2	2003
9.39	3014.2	90.61	29102.8	24.78	32117.0	2004

17.33	4572.0	82.67	21803.20	-17.87	26375.20	2005
15.53	6027.7	84.47	32779.0	47.13	38806.7	2006
19.79	7723.0	80.21	31308.2	0.57	39031.2	2007
20.00	11880.67	80.00	47522.7	52.19	59403.37	2008
19.94	13091.0	80.06	52567.0	10.52	65658.0	2009
23.22	19472.0	76.78	64351.0	27.66	83823.0	2010
31.10	30066.3	68.90	66596.5	15.31	96662.8	2011
27.92	29351.0	72.08	75788.6	50.97	105139.6	2012
33.90	40381.0	66.10	78747.0	13.30	119128.0	2013
21.98	24930.7	78.02	88542.8	-4.74	113473.5	2014
26.37	18564.67	73.63	51832.84	-37.96	70397.51	2015
23.70	15894.0	76.30	51173.43	-47.30	67067.43	2016
21.81	16465.0	78.19	59025.7	12.55	75490.7	2017
17.09	13820.0	82.91	67052.9	7.12	80872.9	2018
21.86	24422.5	78.14	87301.0	38.14	111723.5	2019
4.22	3208.9	95.78	72873.5	-31.90	76082.4	2020
12.95	13322.7	87.5	89526.7	35.18	102849.4	2021
10.30	12018.5	89.7	104941.1	13.71	116959.6	2022

Source / Prepared by the researcher based on:

- Central Bank of Iraq, Annual Economic Reports, Statistics and Research Department, Republic of Iraq, various issues.
- Columns (2, 4, 6) are prepared by the researcher.

3. Analysis of the Development in the Structure of Public Debt in Iraq during the Period (2003–2022)

The history of public debt in Iraq particularly external debt represents one of the most significant political and economic challenges the country has faced. Iraq's borrowing patterns historically lacked alignment with the philosophy of borrowing for productive investment and economic development. Instead, debt accumulation was often driven by difficult political circumstances. For example, during the 1980s, amid the Iran Iraq war, Iraq's external debt was largely directed toward financing the war effort.

Over the years, Iraq faced numerous fiscal and economic challenges that forced the government to resort to both domestic and external borrowing as a financing mechanism. This situation was exacerbated by Iraq's heavy reliance on oil revenues, which are inherently volatile due to fluctuations in global oil prices. Other contributing factors included international economic sanctions imposed on Iraq in the 1990s, three devastating wars, and the subsequent destruction of much of its infrastructure , To assess the development of public debt in Iraq during the period (2003–2022), we refer to the data in Table (3). The analysis shows that Iraq's total public debt generally declined from 222,162.9 billion IQD in 2003 to 99,750.9 billion IQD in 2022. This overall reduction is largely attributed to a significant drop in external debt. In 2003, public debt reached its highest level during the study period, totaling 222,162.9 billion IQD, consisting of 5,543.7 billion IQD in domestic debt and 216,619.2 billion IQD in external debt. This high figure reflected accumulated debts stemming from international sanctions imposed on Iraq until 2003 , Between 2004 and 2008, public debt declined significantly, from 134,920.7 billion IQD in 2004 to 73,303.6 billion IQD in 2008. This amount included 4,455.6 billion IQD in domestic debt and 68,848.0 billion IQD in external debt. The average annual decline was -23.45%, attributed to partial debt forgiveness programs by international institutions such as the United Nations, and initiatives like the Paris and Rome Clubs. In addition, rising oil prices and increased oil exports contributed to Iraq's improved financial standing during this period , However, the global financial crisis, the fall in oil prices, and declining public revenues led to a rise in public debt from 76,233.2 billion IQD in 2009 to 76,942.5 billion IQD in 2010. This included 9,180.8 billion IQD in domestic debt and 67,761.7 billion IQD in external debt, representing a modest annual growth rate of 0.93%. From 2011 to 2013, Iraq's public debt decreased from 75,800.6 billion IQD in 2011 to 69,309.0 billion IQD in 2013. This improvement was due to reduced fiscal deficits, driven by high oil prices and strong crude oil revenues, which allowed the government to cover most of its public spending needs , However, the rise of terrorist groups and the occupation of vast areas of Iraqi territory in 2014, coupled with the collapse of oil markets, had devastating effects on the Iraqi economy. The resulting surge in military spending and the sharp drop in oil revenues led to a severe fiscal imbalance. Consequently, between 2014 and 2017, Iraq's public debt both internal and external increased significantly, rising from 77,287.9 billion IQD in 2014 to 135,953.0 billion IQD in 2017. In 2018 and 2019, improved security and economic conditions allowed public debt to decline to 75,393.0 billion IQD and 69,498.0 billion IQD, respectively, with negative annual growth rates of -44.54% and -7.82%.

In 2020, the COVID-19 pandemic led to increased public debt, which rose to 94,575.0 billion IQD, reflecting a positive annual growth rate of 36.08%. This increase was driven by a collapse in global oil demand, which severely impacted Iraq's federal budget revenues. At the same time, public expenditures especially in the health sector rose sharply , The upward trend in public debt continued into 2021, reaching 101,460.05 billion IQD. However, in 2022,

Iraq's public debt declined again to 99,750.9 billion IQD due to a fiscal surplus resulting from higher oil prices and increased oil revenues. This total included 69,496.7 billion IQD in domestic debt and 30,254.2 billion IQD in external debt, marking a negative annual growth rate of -1.68% compared to 2021 , In general, external debt constituted the majority of Iraq's total debt throughout the study period, except for the years between 2018 and 2022, when domestic debt became the larger component due to the factors discussed above.

Table (3)Development of the Structure of Public Debt in Iraq for the Period (2003–2022)

The proportion of external debt to public debt	External One billion dinars	The percentage of local debt to public debt	Local debt One billion dinars	The annual growth rate of public debt % %	Public debt One billion dinars	Years
97.50	216619.2	2.49	5543.7	-------	222162.9	2003
95.60	128995.6	4.39	5925.1	-39.26	134920.7	2004
94.36	104710.3	4.63	6255.6	-17.75	110965.9	2005
95.20	105323.3	4.79	5307.0	-0.30	110630.3	2006
94.57	90567.1	5.42	5193.7	-13.44	95760.8	2007
93.92	68848.0	6.07	4455.6	-23.45	73303.6	2008
88.93	67799.2	11.06	8434.0	4.0	76233.2	2009
88.06	67761.7	11.93	9180.8	0.93	76942.5	2010
90.17	68353.7	11.22	7446.9	-1.48	75800.6	2011
91.04	66551.8	8.95	6547.5	-3.56	73099.3	2012
93.86	65053.5	6.13	4255.5	-5.19	69309.0	2013
87.68	67767.9	12.31	9520.0	11.51	77287.9	2014
69.62	73684.8	30.37	32142.8	36.93	105827.6	2015
63.43	82169.5	36.56	47362.3	22.40	129531.8	2016
64.92	88274.2	35.07	47678.8	4.96	135953.0	2017
41.68	31429.0	58.29	43954.0	-44.54	75393.0	2018
44.01	30588.0	55.98	38910.0	-7.82	69498.0	2019
29.94	28320.0	70.05	66255.0	36.08	94575.0	2020
31.09	31547.65	68.90	69912.4	7.27	101460.05	2021
30.32	30254.2	69.67	69496.7	-1.68	99750.9	2022

Source: Prepared by the researcher based on:

- Central Bank of Iraq, Annual Economic Reports, Statistics and Research Department, Republic of Iraq, various issues.
- Columns (2, 4, 6) are prepared by the researcher.
- **Analysis of Budget Surplus and Deficit Trends in Iraq during the Study Period (2003–2022)**

The general budget represents the state's financial program for the upcoming fiscal year. It also serves as the government's financial plan, forming an integral part of the broader social, economic, and political framework. The general budget outlines the projected expenditures for the fiscal year and the available resources or revenues to finance them , In the case of Iraq, the budget is highly sensitive to economic variables and conditions, the most notable of which is the structural imbalance in the Iraqi economy and the limited contribution of vital sectors to economic diversification and development. Public spending in Iraq often exceeds actual government revenues, resulting in a mismatch between real expenditures and expected revenues. Consequently, Iraq remains largely a recipient of global economic shifts without playing a role in shaping them , To assess the state of Iraq's budget between 2003 and 2022, we refer to Table (4), which illustrates fluctuations between deficits and surpluses throughout the study period. In 2003, Iraq recorded a fiscal deficit of -4,636.2 billion IQD due to a surge in public spending that outpaced actual revenue. Between 2004 and 2008, the general budget recorded surpluses, attributed to the resumption of Iraqi oil exports after the lifting of international sanctions and a significant rise in global oil prices. This led to public revenue growth outpacing government expenditures. In 2004, the surplus amounted to 871.85 billion IQD, rising to 14,060.54 billion IQD in 2005 the highest annual growth rate during that period at 1,512.72%. The surplus further increased to 10,248.84 billion IQD in 2006, 15,933.64 billion IQD in 2007, and peaked at 21,237.67 billion IQD in 2008 , However, due to the global financial crisis at the end of 2008 and the subsequent fall in oil prices, Iraq experienced a

fiscal deficit in 2009 and 2010. In 2009, the deficit amounted to -10,414.48 billion IQD. In 2010, public revenues totaled 70,178.22 billion IQD, while public expenditures reached 84,659.0 billion IQD, resulting in a deficit of -14,480.78 billion IQD , With the rise in oil prices and the rentier nature of the Iraqi economy, which relies heavily on energy sector revenues, Iraq achieved budget surpluses in 2011 and 2012 amounting to 39,167.39 and 14,677.62 billion IQD, respectively.

From 2013 to 2016, the country experienced fiscal deficits again, starting with -5,360.6 billion IQD in 2013. The deficit rose to -12,658.16 billion IQD in 2016 due to a dual crisis: declining global oil prices and the rise of terrorism and security instability. With improved security and recovering oil markets, surpluses were recorded again in 2017 and 2018 at 1,845.2 and 25,696.9 billion IQD, respectively. However, in 2019, the budget showed a deficit of -4,156.5 billion IQD due to increased military spending , In 2020, the COVID-19 pandemic and the shutdown of global economic activities led to a drop in oil demand and prices, resulting in a fiscal deficit of -12,882.7 billion IQD. As the global economy recovered in 2021, Iraq's public revenues rose to 109,081.5 billion IQD, with total public expenditures at 102,849.4 billion IQD, resulting in a budget surplus of 6,232.1 billion IQD. This surplus rose significantly in 2022 to 44,737.8 billion IQD due to rising oil prices following the outbreak of the Russia–Ukraine war.

Table (4)Development of the Public Budget Status in Iraq for the Period (2003–2022)

The growth rate for surplus or %deficit	Excess / deficit	Public expenditures One billion dinars	Public revenues One billion dinars	Years
4	3	2	1	
------	-4636.2	9232.2	4596.0	2003
-118.80	871.85	32117.0	32988.85	2004
1512.72	14060.54	26375.20	40435.74	2005
-27.10	10248.84	38806.7	49055.54	2006
55.46	15933.64	39031.2	54964.84	2007
33.28	21237.67	59403.37	80641.04	2008
-149.03	-10414.48	65658.0	55243.52	2009
31.01	-13644.78	83823.0	70178.22	2010
-189.0	12144.59	96662.8	108807.39	2011
-62.52	14677.62	105139.6	119817.22	2012
-136.52	-5360.6	119128.0	113767.40	2013
46.69	-7863.66	113473.5	105609.84	2014
-800.74	-3927.26	70397.51	66470.25	2015
222.31	-12658.16	67067.43	54409.27	2016
-144.57	1845.2	75490.7	77335.9	2017
1292.63	25696.9	80872.9	106569.8	2018
-94.08	-4156.5	111723.5	107567.0	2019
209.94	-12882.7	76082.4	63199.7	2020
-148.37	6232.1	102849.4	109081.5	2021
617.86	44737.8	116959.6	161697.4	2022

Source: Prepared by the researcher based on the data from Tables (1) and (2) Columns (3, 4) are prepared by the researcher.

5. Analysis of the Development of Fiscal Discipline Rules in Iraq during the Period (2003–2022)

After reviewing the key financial indicators in Iraq, it is now possible to derive the fiscal rules associated with them. Based on this, we can trace the evolution of these rules throughout the study period by analyzing the data presented in Table (5), as follows:

a. Public Expenditure Rule

The lowest ratio recorded during the study period (2003–2022) occurred in 2003, at 49.78%, indicating that government expenditures exceeded available public revenues reflecting a lack of fiscal discipline. Between 2004 and 2008, fiscal discipline was evident due to restrained public spending that did not exceed available revenues. In fact, government revenues during this period surpassed public spending, due to two main factors: rationalized expenditure and the lifting of sanctions on Iraqi oil exports, which coincided with rising global oil prices. These developments resulted in increased public revenues , The highest ratio of revenue coverage of public expenditures during this period was recorded in 2005, at 153.30%. However, with the onset of the global financial crisis and the subsequent drop in oil prices, the revenue coverage ratio declined to 84.13% and 83.72% in 2009 and 2010, respectively. In contrast, the years 2011 and 2012 saw a return to fiscal discipline, with revenue-to-expenditure ratios of 112.56% and 113.96%, respectively. From 2013 to 2016, public expenditures in Iraq once again exceeded available revenues. This was due to an increase in military spending to combat terrorist groups controlling parts of the country, in addition to a sharp

decline in global oil prices the primary source of public revenue for Iraq's rentier economy , As a result, the revenue-to-expenditure ratios were: 95.50% in 2013, 93.07% in 2014, 94.42% in 2015, and 81.12% in 2016 indicating weak or absent fiscal discipline during that period. In contrast, 2017 and 2018 witnessed restored fiscal discipline, with revenues fully covering and even exceeding public expenditures, at rates of 102.44% and 131.77%, respectively. This was followed by a decline in coverage to 96.27% in 2019 and 83.09% in 2020. This decline was attributed to factors such as political instability and the COVID-19 pandemic, which caused a drop in global oil demand and prices. During 2021 and 2022, Iraq succeeded in restoring fiscal discipline under the expenditure rule, with revenues once again exceeding total expenditures reaching 106.05% and 138.25%, respectively.

b. Budget Deficit/Surplus Rule

Iraq demonstrated a weak application of fiscal discipline in 2003 under the budget balance rule, as the fiscal deficit stood at -15.67% of GDP well above the Maastricht Treaty threshold of -3%. This indicates the absence of fiscal discipline. However, between 2004 and 2008, Iraq recorded consistent budget surpluses due to higher oil prices and rising oil revenues, which led to a significant increase in public revenues Accordingly, the surplus-to-GDP ratios were positive during this period, reaching 1.63% in 2004, and peaking at 19.12% in 2005 the highest during the study period , In contrast, 2009 and 2010 saw budget deficits of -7.47% and -8.56%, respectively, due to the global financial crisis and falling oil prices. As oil prices recovered, Iraq recorded budget surpluses again in 2011 and 2012, with ratios of 5.72% and 5.77%, respectively , From 2013 to 2016, Iraq again ran budget deficits due to declining oil revenues and the loss of control over some oil fields due to terrorism. As a result, the deficit-to-GDP ratios were -1.95%, -2.95%, -1.88%, and -6.44% for the years 2013 to 2016, respectively , With the recovery of oil markets, Iraq achieved surpluses in 2017 and 2018, with ratios of 0.81% and 10.23%, respectively. However, 2019 saw a deficit of -1.56%, and the impact of the COVID-19 pandemic in 2020 pushed the ratio to -5.86% , As oil prices rebounded in 2021 and 2022, Iraq once again recorded budget surpluses, with ratios of 2.05% and 11.63%, respectively. Overall, Iraq achieved positive ratios under this rule during most years of the study period, except for specific years affected by severe political or economic shocks.

c. Public Debt Rule

This rule evaluates the success or failure of fiscal discipline based on the ratio of public debt to GDP. According to the Maastricht Treaty, this ratio should not exceed 60% (Monthly Report, 2018, p. 57) .

In Iraq, this rule was breached significantly during the period from 2003 to 2007. In 2003, the debt-to-GDP ratio was 750.91% the highest during the study period. Although the ratio decreased starting in 2004 due to partial debt forgiveness (including debts owed to the Paris and Rome Clubs), it remained above the safe threshold. For example, in 2004, the ratio was 253.44%, largely due to high external debt , The ratio declined over subsequent years, reaching 88.80% in 2007, indicating gradual progress in fiscal consolidation. Between 2008 and 2015, Iraq generally maintained the debt-to-GDP ratio within acceptable levels, below the 60% threshold. For instance, the ratio was 46.99% in 2008, rising to 54.71% in 2009, and reaching its lowest point during the period 25.97% in 2012, reflecting improved fiscal discipline. However, the ratio once again exceeded the Maastricht threshold in 2016 and 2017 due to a decline in revenues and increased government borrowing. It reached 65.90% and 60.23% in those years, respectively , From 2018 to 2022, the debt-to-GDP ratio remained below the 60% threshold, reaching its lowest point in 2022 at 25.93%. This improvement was due to rising oil revenues, as Iraq's public debt level is closely tied to fluctuations in oil income—typical of a rentier state. Additionally, the public debt level depends on the political and security situation, and the government's willingness to reduce debt, particularly external debt, through international negotiations.

Thus, the effectiveness of fiscal discipline policies becomes evident through rationalizing public spending to address current and future economic challenges.

d. The Golden Rule

The golden rule is considered one of the most important, effective, and applicable fiscal rules particularly in developing countries as a means of achieving an acceptable level of fiscal discipline. According to international studies and reports, the golden rule is regarded as the most suitable framework for ensuring financial stability and discipline in Iraq by controlling fluctuations in public spending and directing it more efficiently (Ghazazi, 2015, p. 281) .

As illustrated in the table, Iraq's general budget recorded a fiscal deficit, resulting in a surplus or deficit-to-investment expenditure ratio of approximately -247.93%. This indicates that the golden rule was exceeded by more than 100%, implying that borrowing was used to finance current (operational) expenditures rather than investment spending , During the period 2004–2008, Iraq achieved consistent budget surpluses. Accordingly, the golden rule recorded positive ratios 28.92% in 2004 (the lowest during this period) and 307.53% in 2005 (the highest). In 2009 and 2010, fiscal deficits returned, and the golden rule posted negative values of -79.55% and -70.07%, respectively. However, these values still fell within the acceptable threshold of the golden rule. With rising oil prices and increased oil

exports, Iraq again posted budget surpluses in 2011 and 2012, with golden rule ratios of 40.39% and 50.00%, respectively. However, the decline in oil prices and the deterioration of security conditions between 2013 and 2016 led to reduced public revenues and subsequent fiscal deficits. During this period, the golden rule recorded negative values of -13.27% in 2013, -31.54% in 2014, -21.15% in 2015, and -79.64% in 2016 all of which remained within the golden rule's boundaries , From 2017 to 2022, Iraq's fiscal performance fluctuated, alternating between surpluses and deficits. In 2017 and 2018, the country recorded budget surpluses, and the golden rule posted positive values of 11.20% and 185.93%, respectively. However, in 2019 and 2020, increased public spending relative to revenues led to deficits, though the ratio of investment expenditures to borrowing remained within the golden rule threshold at -17.01% and -39.97%, respectively , With the recovery of global oil markets and rising prices, Iraq achieved significant budget surpluses in 2021 and 2022. The golden rule ratios reached 46.77% in 2021 and 372.24% in 2022 the highest recorded during the entire study period.

Table (5)Fiscal Discipline Rules in Iraq for the Period (2003–2022)

The golden rule	Public debt base	Budget deficit base	Public expenditures base	Years
Overseas or deficit / investment expenses *100	Total public debt / GDP *100	The percentage of surplus or deficit / GDP *100	Public revenue / public expenditures *100	
-247.93	91.075	-15.67	49.78	2003
28.92	253.44	1.63	102.71	2004
307.53	150.90	19.12	153.30	2005
170.02	115.73	10.72	126.40	2006
206.31	88.80	14.77	140.82	2007
178.75	46.99	1.36	135.75	2008
-79.55	54.71	-7.47	84.13	2009
-70.07	48.31	-8.56	83.72	2010
40.39	35.71	5.72	112.56	2011
50.00	28.75	5.77	113.96	2012
-13.27	25.97	-1.95	95.50	2013
-31.54	29.00	-2.95	93.07	2014
-21.15	50.90	-1.88	94.42	2015
-79.64	65.90	-6.44	81.12	2016
11.20	60.23	0.81	102.44	2017
185.93	30.02	10.23	131.77	2018
-17.01	26.10	-1.56	96.27	2019
-39.97	43.03	-5.86	83.09	2020
46.77	33.51	2.05	106.05	2021
372.24	25.93	11.63	138.25	2022

Source: Prepared by the researcher based on:

- The Public Expenditure Rule was derived using the formula (Public Revenues / Public Expenditures * 100), based on the data from Table (4).
- The Budget Deficit Rule was derived using the formula (Surplus or Deficit / GDP * 100), based on the data from Tables (4) and (6).
- The Public Debt Rule was derived using the formula (Total Public Debt / GDP * 100), based on the data from Tables (3) and (6).
- The Golden Rule was derived using the formula (Surplus or Deficit / Investment Expenditures * 100), based on the data from Tables (2) and (4).

6.Analysis of the Development of Gross Domestic Product (GDP) and Economic Growth

Gross Domestic Product (GDP) is the primary indicator used to measure economic growth, as it represents the total value of all goods and services produced within a country. An increase in GDP positively impacts government spending on both economic and service sectors, while a decline in GDP results in decreased public spending across these sectors. Thus, GDP and economic growth are closely interconnected two sides of the same coin (Todaro, 2009, p. 50) .

To assess the evolution of Iraq's GDP and growth rates between 2003 and 2022, we refer to Table (6). The data reveals a significant rise in GDP from **29,585.8 billion IQD in 2003** to **155,982.3 billion IQD in 2008**, marking a positive annual growth rate of approximately **44.65%** compared to 2007 , However, by the end of 2008, the global

financial crisis that began in the United States caused oil prices to drop to around **$58.96 per barrel**, leading to a decline in Iraq's GDP in 2009 to **139,330.2 billion IQD**, and a negative annual growth rate of **-10.67%**. Between 2010 and 2013, GDP rose from **159,253.6 billion IQD** to **273,587.5 billion IQD**, with a positive annual growth rate of **7.61% in 2013** compared to 2012 (Al-Jubouri & Hussein, 2018, p. 151) . This growth was largely driven by increased oil revenues, which coincided with rising global oil prices and political instability across the Arab region , In contrast, during 2014–2016, GDP declined significantly, recording negative growth rates of **-2.61%**, **-21.97%**, and **-5.45%**, respectively. These drops were caused by falling oil prices, the shutdown of northern oil fields due to terrorist control over parts of Iraq, and increased U.S. shale oil production. Although oil prices fell to **$36 per barrel in 2016**, the GDP decline was less severe than in 2015 due to greater contributions from other productive sectors, such as electricity, water, and manufacturing. From 2017 to 2019, GDP gradually increased from **225,722.4 billion IQD** to **266,190.6 billion IQD**, with annual growth rates of **14.85%**, **11.22%**, and **6.02%**, respectively. These increases were supported by rising oil output and prices , With the onset of the COVID-19 pandemic in 2020 and the implementation of global lockdowns, oil demand collapsed, prices dropped to **$40.69 per barrel**, and Iraq's GDP declined to **219,768.8 billion IQD** an annual contraction of **-17.43%** compared to 2019. In 2021, Iraq's economy began to recover due to higher oil production, the easing of OPEC restrictions, and the gradual resolution of COVID-19 impacts. These developments positively influenced GDP at both current and constant prices. As a result, GDP rose to **302,691.9 billion IQD in 2021** and further to **384,555.2 billion IQD in 2022**, with annual growth rates of **37.73%** and **27.4%**, respectively.

Table (6)Development in the Size of GDP and Economic Growth at Current Prices in Iraq for the Period (2003–2022)

Annual growth % rate	GDP at current prices One billion dinar	Years	Annual growth % rate	GDP at current prices One billion dinars	Years
7.61	273587.5	2013	- - -	29585.8	2003
-2.61	266420.4	2014	79.39	53235.4	2004
-21.97	207876.2	2015	38.12	73533.6	2005
-5.45	196536.4	2016	29.99	95588.0	2006
14.85	225722.4	2017	12.80	107828.5	2007
11.22	251064.5	2018	44.65	155982.3	2008
6.02	266190.6	2019	-10.67	139330.2	2009
-17.43	219768.8	2020	14.29	159253.6	2010
37.73	302691.9	2021	33.28	212254.9	2011
27.04	384555.2	2022	19.77	254225.5	2012

Source: Prepared by the researcher based on the Central Bank of Iraq, Annual Bulletins and Economic Reports, Statistics and Research Department, Republic of Iraq, various issues, multiple pages.

Three: Measuring the Impact of Fiscal Discipline on Economic Growth in Iraq

This chapter relies on a set of variables derived from the analytical part of the study to determine the interrelationships between them. The statistical software **EViews10** was used to analyze the effect of fiscal discipline rules on economic growth in Iraq.

Model Specification

The functional form of the model is: $\mathbf{Y_1 = f(X_1, X_2, X_3, X_4)}$ Where:

- $\mathbf{Y_1}$: Gross Domestic Product (GDP) at current prices (in million IQD)
- $\mathbf{X_1}$: Public Expenditure Rule
- $\mathbf{X_2}$: Budget Deficit/Surplus Rule
- $\mathbf{X_3}$: Public Debt Rule
- $\mathbf{X_4}$: Golden Rule

1. Johansen Juselius Cointegration Test Results

The cointegration test revealed the existence of **two cointegrating vectors** among the variables, based on the Trace Statistic (**λ trace**) and the Maximum Eigenvalue Statistic. This indicates a long-term equilibrium relationship between the variables.

Table (7)Results of the Johansen - Juselius Cointegration Test for the Study Variables in Iraq for the Period (2003–2022)

Date: 12/13/24 Time: 14:34
Sample (adjusted): 2003Q4 2022Q1
Included observations: 74 after adjustments
Trend assumption: Linear deterministic trend
Series: Y1 X1 X2 X3 X4
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.679772	144.1271	69.81889	0.0000
At most 1 *	0.362416	59.86165	47.85613	0.0025
At most 2	0.215086	26.55653	29.79707	0.1129
At most 3	0.100262	8.635104	15.49471	0.4002
At most 4	0.010979	0.816912	3.841466	0.3661

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.679772	84.26546	33.87687	0.0000
At most 1 *	0.362416	33.30512	27.58434	0.0082
At most 2	0.215086	17.92143	21.13162	0.1328
At most 3	0.100262	7.818193	14.26460	0.3975
At most 4	0.010979	0.816912	3.841466	0.3661

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Prepared by the researcher based on the outputs of EViews 10 software.

2. Optimal Lag Length Selection

According to the three selection criteria (**AIC, HQ, SC**), the second lag was identified as the optimal lag length for the Vector Error Correction Model (**VECM**), since it provided the lowest values across all criteria. Therefore, this lag was used in the model estimation.

Table (8)Results of Optimal Lag Length Selection Tests for the Vector Error Correction Model (VECM)

VAR Lag Order Selection Criteria
Endogenous variables: Y1 X1 X2 X3 X4
Exogenous variables: C
Date: 12/13/24 Time: 14:35
Sample: 2003Q1 2022Q4
Included observations: 74

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2135.522	NA	9.17e+18	57.85193	58.00761	57.91404
1	-1572.879	1034.046	4.49e+12	43.32106	44.25514	43.69367
2	-1455.545	199.7848*	3.74e+11*	40.82555*	42.53803*	41.50867*
3	-1445.734	15.37934	5.77e+11	41.23606	43.72694	42.22970

* 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

Source: Prepared by the researcher based on the outputs of EViews 10 software.

3. VECM Long-Run Estimation Results

The long-run estimation (Table 9) showed that:

- **The public expenditure rule (X_1)** had a **positive and statistically significant** impact on GDP, with a **t-value of 5.01026**, indicating that a 1-unit increase in this rule raises GDP by approximately **10,069.91 units**.

- **The budget deficit rule (X_2)** had a **negative and significant** impact on GDP, with a **t-value of -4.34185**, reflecting the adverse effect of increasing fiscal deficits.
- **The public debt rule (X_3)** surprisingly had a **positive and significant** effect, with a **t-value of 14.81111**, indicating that increased borrowing was, in the Iraqi context, associated with higher GDP (possibly due to investment in infrastructure).
- **The golden rule (X_4)** had a **negative and significant** impact on GDP, with a **t-value of -2.94148**, possibly due to insufficient investment allocations toward productive sectors.

Table (9)Long-Run Coefficients Results of the VECM Model

Vector Error Correction Estimates
Date: 11/23/24 Time: 12:46
Sample (adjusted): 2003Q4 2022Q1
Included observations: 74 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
Y1(-1)	1.000000
X1(-1)	10069.91 (2009.86) [5.01026]
X2(-1)	-12565.55 (2894.06) [-4.34185]
X3(-1)	2652.425 (179.084) [14.8111]
X4(-1)	-1068.141 (363.130) [-2.94148]
C	-1388108.

Source: Prepared by the researcher based on the outputs of EViews 10 software.

4. Short-Run Estimation and Error Correction Results (2003–2022)

- The **coefficient of determination R^2** was **67%**, and the **adjusted R^2** was **62%**, meaning that 62% of the variation in GDP is explained by the fiscal rules.
- The **F-statistic** had a **p-value of 0.0000**, confirming the overall significance of the model.
- The **Error Correction Term (ECT)** was **-0.000129**, which is negative, statistically significant, and less than one indicating a **valid long-run equilibrium relationship** and **slow speed of adjustment** toward equilibrium following economic shocks.

Model validation tests (Appendices 3, 4, 5) confirmed the model's reliability.

Conclusions

1. **Fiscal discipline** is a key policy tool for managing public expenditure efficiently, in line with revenue availability and without overburdening the economy.
2. No single fiscal rule perfectly satisfies all evaluation criteria; rules differ in strengths and trade-offs when applied.
3. Iraq's budget is heavily dependent on **oil revenues**, which makes it vulnerable to external price shocks.
4. **External debt** has historically made up the bulk of Iraq's public debt, although **domestic debt** has increased in recent years.
5. Iraq's progress in applying fiscal rules has been **limited**, with relatively better performance under the **public debt rule**.
6. Cointegration analysis confirms **long-run equilibrium relationships** between the variables and GDP.
7. Time series analysis shows variables are **non-stationary at level** but **stationary at first difference**, suitable for cointegration techniques.
8. The **budget deficit rule** and **golden rule** had **negative effects** on GDP, while the **public expenditure rule** and **public debt rule** had **positive effects**—suggesting a government preference for fiscal balance over growth-oriented investment, or a focus on infrastructure rather than sustainable development.

Recommendations

1. Iraq should adopt a **comprehensive fiscal discipline strategy** that ensures financial sustainability, promotes good governance, and supports sustainable development across economic, social, and environmental dimensions.
2. Efforts must be made to **diversify revenue sources**, particularly through tax system reform that ensures efficiency without burdening vulnerable groups, alongside effective anti-corruption enforcement.
3. The structure of public spending must be rebalanced by **limiting current expenditures** and increasing **investment spending** to enhance productive capacity and human capital development.
4. Iraq should **stimulate the private sector** and invest in **key economic sectors** (e.g., agriculture, industry) while reducing dependence on crude oil. Environmental standards must also be integrated into these investment efforts.
5. The establishment of a **sovereign wealth fund**, similar to Norway's, is recommended to **stabilize the budget** by investing surplus revenues during oil booms, ensuring long-term fiscal sustainability, and reducing dependence on a volatile external resource.
6. **References :**

Abdulaziz, M. I., & Farhan, M. S. (2022). *The extent to which government revenues can be maximized in Iraq through fiscal discipline (2004–2019)*. Kirkuk University Journal for Administrative and Economic Sciences, 12(2), p. 202.

Abdulrahman, M. H. (2011). *Sustainable development and the requirements to achieve it*. Paper presented at the Forum on Government Strategies to Eliminate Unemployment and Achieve Sustainable Development, p. 7.

Abu Bakr Ali, A. (2011). *Traditional and contemporary concepts in public financial management*. Arab Monetary Fund, Economic and Technical Department, Abu Dhabi, p. 12.

Al-Asadi, I. A. H. (n.d.). *The impact of rationalizing public spending on budget control – Selected countries with special reference to Iraq (2004–2021)*, p. 90.

Al-Haidari, J. I. (2009). *Administrative corruption and its legal, political, economic, and social dimensions* (1st ed.). House of Wisdom, Baghdad, Iraq, pp. 92–97.

Ali, I. A., & Ahmed, M. S. (2019). *The role of fiscal discipline in maintaining the stability of the Iraqi dinar exchange rate*. Al-Mustansiriyah Journal for Arab and International Studies, 4, p. 5.

Ali, I. A., & Hassan, M. S. (2019). *The role of fiscal discipline and monetary sterilization in achieving economic stability in Iraq (2004–2016)*. Journal of Administration and Economics, 121, p. 493.

Al-Janabi, H. A. (2015). *The impact of exports on economic growth in Iraq (1991–2011)*. Baghdad College of Economic Sciences University Journal, 46, p. 139.

Al-Juhaimi, S. A. Z. (2019). *Fiscal discipline and its reflection on the sustainable development process in Iraq*. Iraqi Journal of Economic Sciences, 60, pp. 27–28.

Al-Shadhili, A. S. (2014). *The general framework of financial stability and the role of central banks in achieving it*. Arab Monetary Fund, p. 16.

Al-Sheikh Radi, M. I., & Hassan, F. M. (2013). *The future of fiscal policy in Iraq between rentierism and diversification*. Al-Ghari Journal of Economic and Administrative Sciences, University of Kufa, 28, p. 184.

Al-Zubaidi, A. A. Z., & Al-Awadi, M. S. H. (2021). *Investment in smart cities and its role in achieving sustainable development* (1st ed.). Al-Wifaq Publishing, Amman, Jordan, p. 54.

Cordes, T., et al. (2015). *Expenditure rules: Effective tools for sound fiscal policy*. IMF Working Paper, Fiscal Affairs Department, p. 6.

Fatas, A., & Mihov, I. (2004). *Fiscal discipline, volatility, and growth*. INSEAD and CEPR, p. 49.

Hemming, R. (2011). *Fiscal discipline and public sector efficiency*. International Monetary Fund, USA, pp. 3–4.

Margot, S. (2013). *La régulation financière face à la crise*. Éditions Bruylant, Bruxelles, p. 26.

Petrov, V. (2017). *Advantages and disadvantages of fiscal discipline in Bulgaria in times of crisis*. Contemporary Economics, 8(1), 13.

Tirole, J. (2014). *Les contours de l'initiative bancaire et l'avenir de la régulation*. Revue Française d'Économie, p. 94.

UNDP. (2021). *Sustainable Recovery from COVID-19 in Iraq*. United Nations Development Programme in Iraq, p. 9.

Yilin, H. (2003). *Fiscal discipline as a capacity measure of financial management by subnational governments*, p. 3

Scientific Appendixes

Appendix (1)

Iraq model data

	Y1	Y2	Y3	Y4	Y5	X1	X2	X3	X4
2003Q1	29585.8	2452967	355363	205221	37623	49.78	-15.67	750.91	-247.93
2003Q2	35498.2	2753650	717174.8	324798.3	39542.25	63.0125	-11.345	626.5425	-178.718
2003Q3	41410.6	3054332	1078987	444375.5	41461.5	76.245	-7.02	502.175	-109.505
2003Q4	47323	3355015	1440798	563952.8	43380.75	89.4775	-2.695	377.8075	-40.2925
2004Q1	53235.4	3655697	1802610	683530	45300	102.71	1.63	253.44	28.92
2004Q2	58309.95	3643788	1720155	694676.5	50775	115.3575	6.0025	227.805	98.5725
2004Q3	63384.5	3631879	1637699	705823	56250	128.005	10.375	202.17	168.225
2004Q4	68459.05	3619969	1555244	716969.5	61725	140.6525	14.7475	176.535	237.8775
2005Q1	73533.6	3608060	1472788	728116	67200	153.3	19.12	150.9	307.53
2005Q2	79047.2	3652169	1617570	828317.3	67700	146.575	17.02	142.1075	273.1525
2005Q3	84560.8	3696278	1762351	928518.5	68200	139.85	14.92	133.315	238.775
2005Q4	90074.4	3740386	1907133	1028720	68700	133.125	12.82	124.5225	204.3975
2006Q1	95588	3784495	2051914	1128921	69200	126.4	10.72	115.73	170.02
2006Q2	98648.13	3810566	2221076	1265862	71900	130.005	11.7325	108.9975	179.0925
2006Q3	101708.3	3836637	2390239	1402803	74600	133.61	12.745	102.265	188.165
2006Q4	104768.4	3862707	2559401	1539743	77300	137.215	13.7575	95.5325	197.2375
2007Q1	107828.5	3888778	2728563	1676684	80000	140.82	14.77	88.8	206.31
2007Q2	119867	3948695	3282220	1820333	263100	139.5525	11.4175	78.3475	199.42
2007Q3	131905.4	4008612	3835876	1963983	446200	138.285	8.065	67.895	192.53
2007Q4	143943.9	4068529	4389533	2107632	629300	137.0175	4.7125	57.4425	185.64
2008Q1	155982.3	4128446	4943189	2251281	812400	135.75	1.36	46.99	178.75
2008Q2	151819.3	4125608	5024272	2423016	811175	122.845	-0.8475	48.92	114.175
2008Q3	147656.3	4122771	5105354	2594751	809950	109.94	-3.055	50.85	49.6
2008Q4	143493.2	4119933	5186437	2766485	808725	97.035	-5.2625	52.78	-14.975
2009Q1	139330.2	4117095	5267519	2938220	807500	84.13	-7.47	54.71	-79.55
2009Q2	144311.1	4148813	5605104	2987939	825250	84.0275	-7.7425	53.11	-77.18
2009Q3	149291.9	4180530	5942690	3037658	843000	83.925	-8.015	51.51	-74.81
2009Q4	154272.8	4212248	6280275	3087377	860750	83.8225	-8.2875	49.91	-72.44
2010Q1	159253.6	4243965	6617860	3137096	878500	83.72	-8.56	48.31	-70.07
2010Q2	172503.9	4284802	7288530	3204365	906871.3	90.93	-4.99	45.16	-42.455
2010Q3	185754.3	4325639	7959200	3271634	935242.5	98.14	-1.42	42.01	-14.84
2010Q4	199004.6	4366475	8629869	3338903	963613.8	105.35	2.15	38.86	12.775
2011Q1	212254.9	4407312	9300539	3406172	991985	112.56	5.72	35.71	40.39
2011Q2	222747.6	4505766	9108042	3543877	984584.8	112.91	5.7325	33.97	42.7925
2011Q3	233240.2	4604220	8915546	3681581	977184.5	113.26	5.745	32.23	45.195
2011Q4	243732.9	4702674	8723049	3819286	969784.3	113.61	5.7575	30.49	47.5975
2012Q1	254225.5	4801128	8530552	3956990	962384	113.96	5.77	28.75	50
2012Q2	259066	4833807	8797308	4159518	1016900	109.345	3.84	28.055	34.1825
2012Q3	263906.5	4866485	9064064	4362047	1071416	104.73	1.91	27.36	18.365
2012Q4	268747	4899164	9330819	4564575	1125931	100.115	-0.02	26.665	2.5475
2013Q1	273587.5	4931842	9597575	4767103	1180447	95.5	-1.95	25.97	-13.27

2013Q2	271795.7	4891753	9618963	4612121	1144349	94.8925	-2.2	26.7275	-17.8375
2013Q3	270004	4851665	9640351	4457140	1108251	94.285	-2.45	27.485	-22.405
2013Q4	268212.2	4811576	9661738	4302158	1072152	93.6775	-2.7	28.2425	-26.9725
2014Q1	266420.4	4771487	9683126	4147176	1036054	93.07	-2.95	29	-31.54
2014Q2	251784.4	4794365	9509395	3932783	1114541	93.4075	-2.6825	34.475	-28.9425
2014Q3	237148.3	4817244	9335663	3718390	1193027	93.745	-2.415	39.95	-26.345
2014Q4	222512.3	4840122	9161932	3503996	1271514	94.0825	-2.1475	45.425	-23.7475
2015Q1	207876.2	4863000	8988200	3289603	1350000	94.42	-1.88	50.9	-21.15
2015Q2	205041.3	4997012	9160636	3268027	1493850	91.095	-3.02	54.65	-35.7725
2015Q3	202206.3	5131025	9333072	3246451	1637700	87.77	-4.16	58.4	-50.395
2015Q4	199371.4	5265037	9505507	3224874	1781550	84.445	-5.3	62.15	-65.0175
2016Q1	196536.4	5399049	9677943	3203298	1925400	81.12	-6.44	65.9	-79.64
2016Q2	203832.9	5343608	9790594	2688406	2010050	86.45	-4.6275	64.4825	-56.93
2016Q3	211129.4	5288167	9903244	2173515	2094700	91.78	-2.815	63.065	-34.22
2016Q4	218425.9	5232726	10015895	1658623	2179350	97.11	-1.0025	61.6475	-11.51
2017Q1	225722.4	5177285	10128545	1143731	2264000	102.44	0.81	60.23	11.2
2017Q2	232057.9	5179646	10560635	1187283	5489700	109.7725	3.165	52.6775	54.8825
2017Q3	238393.5	5182006	10992726	1230834	8715400	117.105	5.52	45.125	98.565
2017Q4	244729	5184367	11424816	1274386	11941100	124.4375	7.875	37.5725	142.2475
2018Q1	251064.5	5186727	11856906	1317937	15166800	131.77	10.23	30.02	185.93
2018Q2	254846	5226200	12064450	1404928	15324438	122.895	7.2825	29.04	135.195
2018Q3	258627.6	5265674	12271994	1491918	15482075	114.02	4.335	28.06	84.46
2018Q4	262409.1	5305147	12479538	1578909	15639713	105.145	1.3875	27.08	33.725
2019Q1	266190.6	5344620	12687082	1665899	15797350	96.27	-1.56	26.1	-17.01
2019Q2	254585.2	5156353	12114379	2688848	15954988	92.975	-2.635	30.3325	-22.75
2019Q3	242979.7	4968086	11541676	3711796	16112625	89.68	-3.71	34.565	-28.49
2019Q4	231374.3	4779818	10968973	4734745	16270263	86.385	-4.785	38.7975	-34.23
2020Q1	219768.8	4591551	10396270	5757693	16427900	83.09	-5.86	43.03	-39.97
2020Q2	240499.6	4583568	10678176	5005466	17065750	88.83	-3.8825	40.65	-18.285
2020Q3	261230.4	4575585	10960082	4253238	17703600	94.57	-1.905	38.27	3.4
2020Q4	281961.1	4567601	11241987	3501011	18341450	100.31	0.0725	35.89	25.085
2021Q1	302691.9	4559618	11523893	2748783	18979300	106.05	2.05	33.51	46.77
2021Q2	323157.7	4613125	11676417	3124897	20430350	114.1	4.445	31.615	128.1375
2021Q3	343623.6	4666631	11828940	3501011	21881400	122.15	6.84	29.72	209.505
2021Q4	364089.4	4720138	11981464	3877124	23332450	130.2	9.235	27.825	290.8725
2022Q1	384555.2	4773644	12133987	4253238	24783500	138.25	11.63	25.93	372.24

Appendix (2)

(2003 -2022) Results of estimated error correction and short-term parameters for the period

Error Correction:	D(Y1)	D(X1)	D(X2)	D(X3)	D(X4)
CointEq1	-0.000129	3.30E-06	1.68E-06	-0.007399	2.99E-05
	(1.4E-05)	(8.6E-06)	(2.9E-06)	(0.01119)	(4.6E-05)
	[-9.48168]	[0.38208]	[0.57218]	[-0.66123]	[0.64422]
D(Y1(-1))	0.894513	6.80E-05	2.39E-05	-0.000130	0.000442
	(0.15064)	(0.00012)	(4.0E-05)	(0.00018)	(0.00062)
	[5.93789]	[0.58412]	[0.60310]	[-0.70682]	[0.70709]
D(Y1(-2))	-0.131326	-3.57E-05	-1.05E-05	-2.48E-05	3.80E-06
	(0.15689)	(0.00012)	(4.1E-05)	(0.00019)	(0.00065)
	[-0.83704]	[-0.29416]	[-0.25339]	[-0.12944]	[0.00584]
D(X1(-1))	-527.1642	0.479316	-0.093048	-0.862354	-1.980985
	(762.477)	(0.58939)	(0.20045)	(0.92995)	(3.16150)
	[-0.69138]	[0.81324]	[-0.46420]	[-0.92731]	[-0.62660]
D(X1(-2))	-74.66575	-0.305365	-0.076259	1.336956	-1.316619
	(825.578)	(0.63817)	(0.21704)	(1.00692)	(3.42313)
	[-0.09044]	[-0.47850]	[-0.35137]	[1.32777]	[-0.38462]
D(X2(-1))	605.9346	0.350151	0.890637	0.933398	2.095443
	(1074.02)	(0.83021)	(0.28235)	(1.30993)	(4.45326)
	[0.56417]	[0.42176]	[3.15440]	[0.71256]	[0.47054]
D(X2(-2))	381.3890	0.583619	-0.014015	-2.061253	3.485624
	(1095.13)	(0.84653)	(0.28790)	(1.33568)	(4.54080)
	[0.34826]	[0.68942]	[-0.04868]	[-1.54323]	[0.76762]
D(X3(-1))	-28.80963	0.018160	0.008440	0.156471	0.150047
	(78.6274)	(0.06078)	(0.02067)	(0.09590)	(0.32602)
	[-0.36641]	[0.29879]	[0.40832]	[1.63165]	[0.46024]
D(X3(-2))	7.294228	-0.026011	-0.009268	-0.142256	-0.107073
	(60.9735)	(0.04713)	(0.01603)	(0.07437)	(0.25282)
	[0.11963]	[-0.55186]	[-0.57819]	[-1.91292]	[-0.42352]
D(X4(-1))	69.47609	0.041618	0.013374	0.097655	1.068993
	(106.918)	(0.08265)	(0.02811)	(0.13040)	(0.44332)
	[0.64981]	[0.50356]	[0.47583]	[0.74888]	[2.41135]
D(X4(-2))	13.45916	-0.004789	0.004625	-0.120508	-0.109950
	(120.092)	(0.09283)	(0.03157)	(0.14647)	(0.49794)
	[0.11207]	[-0.05158]	[0.14651]	[-0.82275]	[-0.22081]
C	803.4314	-0.065258	-0.029547	-5.906290	0.042437
	(925.383)	(0.71532)	(0.24327)	(1.12864)	(3.83696)
	[0.86821]	[-0.09123]	[-0.12146]	[-5.23309]	[0.01106]
R-squared	0.677587	0.646120	0.649222	0.910295	0.672255
Adj. R-squared	0.620385	0.583335	0.586987	0.894380	0.614107
Sum sq. resids	1.93E+09	1154.197	133.4963	2873.396	33209.10
S.E. equation	5581.706	4.314636	1.467367	6.807724	23.14369
F-statistic	11.84544	10.29099	10.43180	57.19614	11.56106
Log likelihood	-736.8715	-206.6440	-126.8318	-240.3913	-330.9425
Akaike AIC	20.23977	5.909297	3.752210	6.821386	9.268715
Schwarz SC	20.61340	6.282929	4.125842	7.195018	9.642348
Mean dependent	4637.089	0.837905	0.252027	-6.435743	6.510068
S.D. dependent	9059.309	6.684222	2.283268	20.94735	37.25626

Source: Prepared by the researcher based on the outputs of the EVIEWS10 program)

(3) Appendix
Serial Correlation LM Test test

VEC Residual Serial Correlation LM Tests
Date: 11/23/24 Time: 12:54
Sample: 2003Q1 2022Q4
Included observations: 74

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	43.62794	25	0.0119	1.833458	(25, 198.4)	0.0121
2	23.45159	25	0.5512	0.938099	(25, 198.4)	0.5527

Source: Prepared by the researcher, relying on the outputs of the (EVIEWS10 program)

Appendix

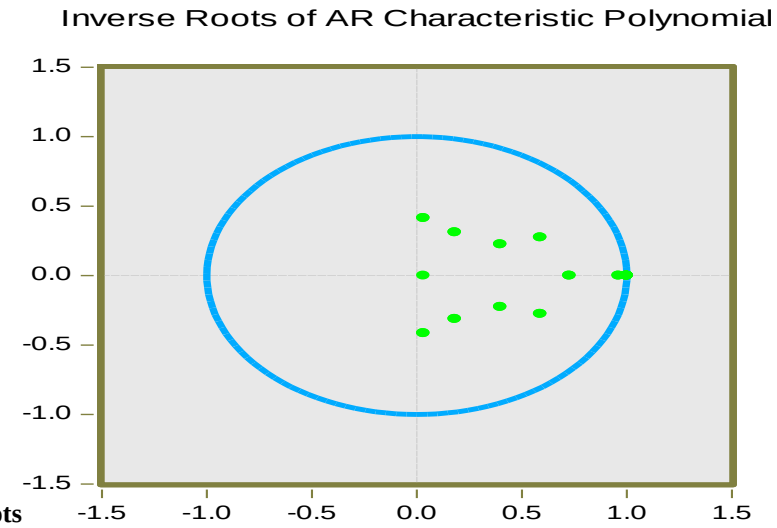
(4) Heteroscedasticity test results

VEC Residual Heteroskedasticity Tests (Levels and Squares)
Date: 11/23/24 Time: 12:55
Sample: 2003Q1 2022Q4
Included observations: 74

Joint test:

Chi-sq	df	Prob.
318.0767	330	0.6714

Source: Prepared by the researcher, relying on the outputs of the EVIEWS10 program))



Appendix (5) Test of many distinctive roots

Source: Prepared by the researcher, relying on the outputs of the EVIEWS10 program**))**