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MEASURING AND ANALYZING THE IMPACT OF INTERNAL GOVERNMENT DEBT ON SOME INDICATORS OF SUSTAINABLE DEVELOPMENT IN IRAQ

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Abstract:

The research aimed to measure and analyze the impact of domestic government debt on some indicators of sustainable development in Iraq, represented by (Gross Domestic Product (GDP), government spending on education, and government spending on health). This was done using the ARDL (Autoregressive Distributed Lag) model for both short-term and long-term periods. Semi-annual data for the period (2004-2023) were used, and the research hypothesized that there is both a direct and inverse impact of domestic government debt on some indicators of sustainable development in Iraq. The results of the dynamic interactions in both the short and long term revealed that domestic government debt has both inverse and direct effects on GDP, education spending, and health spending in the short term. In the long term, however, domestic government debt has a direct effect only on GDP and health spending, while it has an inverse effect on education spending. Accordingly, the research recommended that the government diversify funding sources by increasing the issuance of government bonds and attracting foreign investments, while enhancing public debt management to ensure fiscal sustainability. It also suggested strengthening the distributive, service, and mining sectors by improving infrastructure and increasing efficiency, along with improving resource management and directing investments toward projects with high economic and social returns. This would ensure the sustainability of services and promote economic growth in both the short and long term.

Keywords: Domestic government debt, GDP, government spending on education and health, ARDL model

INTRODUCTION

Sustainable development is one of the important goals that countries strive to achieve to ensure sustainable economic growth and improve the quality of life for individuals while preserving natural resources for future generations. In this context, financial policies, particularly the tool of managing government debt, are directly influential in achieving these goals, as domestic government debt plays a pivotal role in financing public expenditures, including spending on vital sectors such as education and health, which are fundamental pillars of sustainable development.

In the Iraqi economy, which heavily relies on oil revenues as a primary source of income, the importance of studying the impact of domestic government debt on some indicators of sustainable development becomes evident, especially in light of the economic and financial challenges facing the country. The Gross Domestic Product (GDP) is one of the key economic indicators that reflects the performance of the overall economy, while spending on education and health indicates the extent of the state's commitment to improving human capital, a crucial element for achieving sustainable development. Therefore, this research aims to measure and analyze the impact of domestic government debt on some indicators of sustainable development in Iraq, focusing on GDP and spending on education and health. This research will explore the relationship between domestic government debt and these indicators, and evaluate the extent to which financial policies affect the achievement of sustainable development goals in Iraq. Recommendations will also be provided to improve the management of government debt to enhance economic growth and achieve sustainable development in the country.

RESEARCH PROBLEM

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The research problem is represented by the main question: "What is the impact of domestic government debt on some indicators of sustainable development in Iraq, particularly GDP and spending on education and health?" In light of the economic challenges facing Iraq, such as excessive reliance on oil revenues and financial instability, there is a need to understand how domestic government debt affects vital sectors that are fundamental to sustainable development. There is also growing concern about the government's ability to manage debt effectively without negatively impacting economic growth and essential services such as education and health.

Importance of the Research

The research helps in understanding the relationship between government debt and GDP, contributing to the formulation of financial policies that support sustainable economic growth.

Research Hypothesis

The research hypothesizes that domestic government debt has both a negative and positive impact in the short term on GDP and spending on education and health, while in the long term it only has a positive impact on GDP and health spending and a negative impact on education spending.

Research Objective

To measure and analyze the impact of domestic government debt on some indicators of sustainable development (GDP, spending on education and health) in Iraq for the period 2004-2023 using the ARDL model.

Study Methodology

The research relied on a descriptive and inductive approach regarding the theoretical framework, and on a quantitative method to test the hypothesis concerning the case study (Iraq).

Study Limits

- **Temporal**: (2004 - 2023).
- **Spatial**: The Iraqi economy.

Chapter One
Theoretical Framework of the Impact of Domestic Government Debt on Some Indicators of Sustainable Development

In this research, the theoretical aspect of domestic government debt on some indicators of sustainable development will be clarified, represented by (GDP, spending on education, spending on health).

Requirement One: The Impact of Domestic Government Debt on GDP

The impact of domestic government debt on GDP is a highly important topic in macroeconomics, as it intersects with many economic and financial aspects. When the government borrows from local sources to finance budget deficits or to implement development projects, this borrowing can serve as a tool to stimulate the economy, especially during periods of recession or when economic growth is weak. If the government, for example, uses borrowed funds to build new roads or schools or hospitals, this not only enhances the country's infrastructure but also creates new job opportunities. These new jobs increase individuals' income, which in turn leads to an increase in private consumption. This type of government spending can act as a stimulus for aggregate demand in the economy, contributing to an increase in GDP in the short term. Additionally, improving infrastructure can have a long-term positive impact on the economy; for example, building a better road network can reduce transportation costs for businesses, making them more competitive.[1]

Therefore, the impact of government debt is not always positive. In the long term, high levels of debt can lead to negative effects on the economy, and one of these effects is known as "Crowding Out."

When the government borrows heavily from local financial markets, it can lead to higher interest rates, and the latter makes borrowing more expensive for the private sector, which reduces private investments. Since private investment is one of the main drivers of economic growth, this crowding out can limit long-term growth. Additionally, as the size of government debt increases, the interest payments that the government must make also rise; these payments can become a burden on the public budget, reducing the government's ability to spend on productive sectors such as education, health, and research and development [2] , In some cases, the government may be forced to cut spending on these vital sectors in order to allocate more funds to debt servicing. This lack of spending on productive sectors can negatively impact long-term economic growth. Furthermore, high levels of government debt can create a state of uncertainty in financial markets. When debt levels are high, investors may begin to doubt the government's ability to repay its debts, and this doubt can lead to higher borrowing costs for the government, as investors demand higher

[1] Joseph Steggles, Public Sector Economics, Dar Al-Shorouk, 2000, p. 245.

[2] Olivier Blanchard, Macroeconomics, Pearson Education, 8th Edition, 2021, PP: 456.

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interest rates to compensate for the increased risks. In extreme cases, this can lead to a crisis of confidence, where the government loses the ability to borrow from financial markets, potentially resulting in a financial or economic crisis.[3] It is also important to consider the factors that determine how government debt affects GDP. For example, in developing economies, where infrastructure is inadequate and there is a pressing need for investment in essential sectors, Government debt can have a greater positive impact, and in these cases, government borrowing can lead to an overall improvement in economic conditions, thereby enhancing long-term growth. On the other hand, the efficiency of government spending plays a crucial role in determining the impact of debt on GDP. If borrowed funds are used effectively in high-return economic projects, the positive impact on economic growth will be greater. Conversely, if borrowed funds are wasted on unproductive or corrupt projects, this can exacerbate economic problems rather than solve them.[4]

Based on the above, it can be said that the impact of domestic government debt on GDP depends on a complex set of factors, including the size of the debt, how borrowed funds are utilized, and the economic policies in place. In the short term, debt can have a positive impact by stimulating aggregate demand and creating job opportunities, but in the long term, it can lead to negative effects such as crowding out and increased debt service burdens. Therefore, governments must manage debt carefully to achieve a balance between economic growth and financial stability, ensuring that borrowed funds are used effectively to maximize economic benefit.

Requirement Two: The Impact of Domestic Government Debt on Education Spending

Public spending on education is one of the fundamental pillars for achieving sustainable development, as it plays a pivotal role in building human capital and enhancing the productive capacities of society. However, high levels of domestic government debt may hinder governments' ability to finance this vital sector, leading to negative effects on the quality of education and opportunities for comprehensive development.

When internal government debts accumulate, governments begin to face increasing financial pressures due to the need to allocate a significant portion of their revenues to service these debts, whether through paying interest or repaying installments. These financial obligations reduce the available space in the public budget for spending on social sectors, including education. As a result, financial allocations for education may be cut, affecting the ability of educational institutions to provide essential services such as building schools, providing books and educational materials, training teachers, and improving educational infrastructure.[5] Additionally, in cases of financial or economic crises, governments may be forced to rearrange spending priorities, redirecting resources from sectors deemed less urgent in the short term, like education, to other more pressing sectors such as health, security, or defense. This shift in priorities can lead to a significant reduction in education spending, negatively impacting the quality of education and access to it, especially in poor or remote areas. Furthermore, high government debt may lead to a decrease in public investment in educational infrastructure, such as building new schools or renovating old ones, providing modern technology in classrooms, and supporting innovative educational programs. This decline in investment undermines the quality of education and limits its ability to keep pace with global developments in the field of education. On the other hand, high government debt can lead to economic instability, as it reduces the confidence of investors and international institutions in the local economy.

This situation may lead to a decrease in economic growth and a decline in public revenues, making it more difficult to finance social sectors such as education. In such cases, governments may resort to reducing public spending in general, including spending on education, which negatively affects students' opportunities to receive a good and equitable education. [6]

Based on the above, it can be said that domestic government debt significantly impacts public spending on education by increasing financial pressures on the public budget and reallocating resources towards other priorities that are considered more urgent in the short term. Additionally, high debt levels may lead to a decline in investments in educational infrastructure and economic instability, negatively affecting the quality of education and access to it. Therefore, prudent financial policies are required to manage debt effectively while maintaining funding for vital sectors

[3] - N. Gregory Mankiw, Principles of Economics, Cengage Learning, 9th Edition, 2020, P: 312.
Paul Krugman and Robin Wells, Economics, Worth Publishers, 9th Edition, 2018, P: 345. [4]

[5] - Barro, R. J, Government Spending in a Simple Model of Endogenous Growth, Journal of Political Economy, 98(5), Part 2, 1990, PP: 103-105.

[6] Reinhart, C. M., & Rogoff, K. S, Growth in a Time of Debt, American Economic Review, 100 (2), 2010, PP: 573-574.

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such as education, to ensure sustainable development and support human capital, which is the foundation of economic and social progress.

Requirement Three: The Impact of Domestic Government Debt on Health Spending

Domestic government debt can affect public spending on health through multiple mechanisms, including the financial pressures imposed by debt servicing on the public budget, which may lead to a reduction in spending on social sectors, including health.

Firstly: The negative effects of domestic government debt on health spending: When government debt levels rise, the proportion of the budget allocated to debt servicing, that is, paying interest and principal, also increases, which can reduce the financial space available for spending on other sectors, including health. According to the International Monetary Fund (IMF), countries suffering from high levels of public debt tend to cut spending on social sectors, including health, to achieve fiscal balance. Additionally, high government debt can lead to delays or cancellations of health infrastructure projects, such as building hospitals or upgrading health facilities due to a lack of funding. Joshua Greene notes that high public debt may limit governments' ability to invest in long-term projects like health infrastructure. Furthermore, high government debt may reduce current spending on health, negatively impacting the quality of health services provided to citizens.[7]

Secondly, potential positive effects: In some cases, governments may prioritize health spending despite high debt levels, especially during health crises like the COVID-19 pandemic. David Cutler points out that some governments may increase health spending in response to health crises even amid high public debt. Additionally, governments may obtain external funding or grants to support health spending, which mitigates the impact of domestic debt on the health budget. [8]According to a 2020 report by the World Health Organization (WHO), some developing countries resort to external financing to support their health programs, reducing the impact of domestic debt on health spending.

Based on the above, it can be said that domestic government debt can have negative effects on public health spending, especially when it leads to a reduction in resources allocated to this vital sector. However, political priorities and emergency health conditions may drive governments to maintain high levels of spending Despite the increase in debt, health spending remains a priority, and thus the impact of domestic government debt on health spending depends on government policies and financial priorities.

Chapter Two
Analysis of the Relationship Between Domestic Government Debt and Some Indicators of Sustainable Development in Iraq

Section One: Analysis of the Structure of Domestic Government Debt in Iraq

Domestic government debt is considered one of the essential financial tools that governments rely on to finance budget deficits and meet developmental and investment needs. The Iraqi economy heavily depends on oil revenues, which are affected by fluctuations in global prices. Domestic government debt plays an important role in financing public expenditures and supporting the economy under difficult economic and political conditions. However, managing this debt requires prudent financial policies and structural reforms to ensure its sustainability and avoid accumulating financial burdens on future generations.

Table (1) illustrates the structure of domestic public debt in Iraq, which includes "debt to the Ministry of Finance, treasury bonds with commercial banks and the central bank, loans from financial institutions, as well as bonds" for the period (2004-2023). It is noted from the table that domestic public debt has increased from (6,061,688) million dinars in 2004 to (69,912,394) million dinars in 2021. This increase is attributed to weak security stability, rising current expenditures, particularly military spending, in addition to declining oil revenues due to fluctuations in oil prices, which subsequently reflects on the public finances of the country. In 2004 and 2005, domestic public debt rose from (6,061,688) to (6,593,960) million dinars respectively, with an annual growth rate of (8.7%) in 2005, This is due to the government issuing treasury bonds at commercial banks, amounting to (924650) and (12900070) million dinars for the years 2004 and 2005, respectively. The contribution of treasury bonds at commercial banks to

[7] Joshua Greene, Public Finance: An International Perspective, Palgrave Macmillan, 2011, P: 245.

[8] David Cutler, The Quality Cure: How Focusing on Health Care Quality Can Save Your Life and Lower Spending Too, University of California Press, 2014, P: 89.

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the internal public debt was (15.2%) and (18.1%), respectively. The debt owed to the Ministry of Finance for these years was (5137038) and (5393890) million dinars, respectively, with a contribution rate of (84.8%) and (81.9%), also respectively. This was a result of the effects of the American occupation, as the government issued these bonds to finance current expenditures, particularly military ones. In the years from (2006 to 2008), the internal public debt decreased from (5645390) to (4455569) million dinars, respectively, with negative annual growth rates of (14.3-%) and (14.2-%), also respectively. This indicates the government's ability to repay its debt, resulting from the reduction of the debt owed by the Ministry of Finance from (5393890) to (3955519) million dinars, respectively, with negative annual growth rates of (13.3-%) and (15.3-%), also respectively, and a contribution rate of (95.5%) and (88.8%), respectively. Additionally, treasury bonds at commercial banks reached (251500) and (500050) for the years from 2006 to 2008, which is attributed to a somewhat improved economic situation and increased oil revenues due to oil exports and rising prices. In the years (2009 and 2010), the internal public debt rose again from (8434049) to (9180806) million dinars, respectively.

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11/9 ratio	11/7 ratio	11/5 ratio	11/1 ratio	% Annual Growth Rate	Total domestic debt +5+1 =9+7 11	% Annual Growth Rate	Bonds	% Annual Growth Rate	Financial Institutions Loans	% Annual Growth Rate	Total Treasury Transfers 3+4=5	Treasury transfers at the Central Bank	Treasury Remittances with Commercial Banks	% Annual Growth Rate	Debt to the Ministry of Finance	years

Table (1): Structure of Internal Public Debt for the period (2004-2023) million dinars

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16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
----	---	15.2	84.8	....	6061688		----		----	....	924650	----	924650	..	51370388	2004
----	---	18.1	81.9	8.7	6593960		----		----	29.7	1200070	----	1200070	5	539389 0	2005
----	---	4.5	95.5	14.3-	5645390		----		----	79-	251500	----	251500	0	539389 0	2006
----	---	10	90	8-	5193705		----		----	106.3	519000	----	519000	13.3-	4674705	2007
----	---	11.2	88.8	14.2-	4455569		----		----	3.6-	500050	----	500050	15.3-	3955519	2008
----	---	53.1	46.9	89.2	8434049		----		----	795.6	4478530	----	4478530	0	3955519	2009
----	---	57	43	8.8	9180806		----		----	16.6	5225287	----	5225287	0	3955519	2010
----	---	52.2	47.8	18.8-	7446859		----		----	25.5-	3891340	----	3891340	10.1-	3555519	2011
----	---	51.9	48.1	12-	6547519		----		----	12.8-	3392000	----	3392000	11.2-	3155519	2012
----	---	35.2	64.8	35-	4255549		----		----	55.7-	1500030	----	1500030	12.6-	2755519	2013
----	---	74.2	25.8	123.7	9520019		----		----	370.9	7064500	----	7064500	10.8-	2455519	2014
0.	32	60	7.	23	32142805		1452		104610	17	193117	622539	13086312	4-	2355	20

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1	.6		3	7.6			5		57	3.3	04	2			519	15
3	22	70	5	47.3	47362251	.. ..	16969945	.. ..	10546233	69.6	32763554	16225392	16538162	0	2355519	2016
56.6	22.1	67.8	4.5	0.6	47678796	58	26824200	0	10546233	1.4-	32294624	16225392	16069232	8.4-	2155519	2017
4.6	22.8	68	4.6	12.2-	41822918	27.1-	19531889	9.9-	9501043	12-	28413167	14925392	13487775	9.2-	1955519	2018
5	22.6	67.9	4.5	8.3-	38331548	1.6-	19212177	8.9-	8651508	8.4-	26003304	14125392	11877912	10.2-	1755519	2019
2.9	22.8	71.8	2.5	67.6	64246559	0.2-	19165221	69.5	14668508	77.3	46106011	40452392	5653619	11.3-	1555519	2020
3	22.8	72	2.2	8.8	69912394	9.4	20978188	8.8	15962934	9	50296123	44452392	5843731	0	1555519	2021
2.9	22.7	72.1	2.2	0.5-	69495737	3.1-	20311166	1.1-	15778976	0.3-	50130126	44452392	5677734	0	1555519	2022
4.6	21.6	67.6	1.7	1.5	70557515	62.0	32910333	3.2-	15261269	4.7-	47749694	42643142	5106552	19.2-	1255519	2023
1.6	10.7	50	37.5	متوسط النسبة												

Source: Prepared by the researcher based on the Central Bank of Iraq, statistical site, financial sector, statistical bulletins for the years (2004-2023)

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With positive annual growth rates of (89.2%) and (8.8%) respectively, the government issued treasury bonds at commercial banks, amounting to (4,478,530) and (5,225,287) million dinars respectively. The contribution of these bonds to the internal public debt was (46.9%) and (43%) respectively for the years 2009 and 2010, while the debt owed by the Ministry of Finance remained the same in 2008. This was due to a decline in oil revenues resulting from a decrease in global demand for oil, which was affected by the repercussions of the global financial crisis that impacted economic activity, leading to an increase in internal public debt through expansion. In the years from (2011 to 2013), the internal public debt decreased from (7,446,859) to (4,255,549) million dinars respectively, with negative annual growth rates of (18.8-%) and (35-%) respectively. This decrease is attributed to the repayment of part of the debt owed by the Ministry of Finance, which fell from (3,555,519) to (2,755,519) million dinars respectively, with negative annual growth rates of (10.1-%) and (26.6-%) respectively. The contribution of the debt owed by the Ministry of Finance to the internal public debt was (47.8%) and (64.8%) respectively for the years from 2011 to 2013. Additionally, the treasury bonds at commercial banks also decreased during the years from 2011 to 2013, from (3,891,340) to (1,500,030) million dinars, with negative annual growth rates of (25.5-%) and (55.7-%) respectively, and a contribution rate of (52.2%) and (35.2%) respectively. This decline is attributed to the amount of old debt owed by the Ministry of Finance to the Central Bank of Iraq through the redemption of the value of bonds and government notes held by it in 2012 , In addition to the decrease in loans granted to government departments by the central bank for that year, the second reason is attributed to the rise in oil revenues due to the increase in global oil prices, leading to an increase in the state's public revenues. From 2014 to 2017, the internal public debt rose from (9,520,019) to (47,678,796) million dinars, with positive annual growth rates of (123.7%) and (0.6%), respectively. This increase was a result of the government's shift towards internal borrowing to meet the financing needs of the general budget, the Martyrs and Political Prisoners Foundation, and the Property Claims Commission, through the issuance of treasury bills and government bonds. The treasury bills held by commercial banks and the central bank reached (7,064,500) million dinars in 2015 and (32,294,624) million dinars in 2017, with negative annual growth rates of (370.9%) and (1.4%), respectively. The contribution of the total treasury bills held by commercial banks and the central bank to the internal public debt was (74.2%) and (67.8%) for the years 2014 to 2017. Additionally, the government issued national bonds and dollar-denominated bonds with maturities ranging from (14,525) to (2,682,420) million dinars from 2015 to 2017, with contribution rates of (0.1%) and (5.6%), respectively. As for loans from financial institutions, they amounted to (10,461,057) and (10,546,233) million dinars from 2015 to 2017, with contribution rates of (32.6%) and (22%), respectively. The debt owed to the Ministry of Finance decreased from (2,455,519) to (2,155,519) million dinars from 2014 to 2017, with negative annual growth rates of (10.8%) and (8.4%), respectively, and contribution rates of (25.8%) and (4.5%), respectively , The increase in domestic public debt from 2014 to 2017 is attributed to the events faced by the country, namely the recent war and the sharp drop in oil prices, which led to a decrease in local liquidity and challenges faced by the public budget. This resulted in the government, represented by the Ministry of Finance, resorting to domestic borrowing to finance that deficit. It issued national bonds and dollar-denominated bonds, as mentioned, and also discounted the transfers issued by it at the central bank in the secondary market. Additionally, it worked to finance the state budget by utilizing 50% of the reserves of commercial banks deposited with the central bank.[9] As for the years 2018 and 2019, domestic public debt decreased from 41,822,918 to 38,331,548 million dinars, with negative annual growth rates of -12.2% and -8.3%, respectively. This decline is attributed to repayments by the Ministry of Finance, which amounted to 1,955,519 and 1,755,519 for the years 2018 and 2019, with negative annual growth rates of -9.2% and -10.2%, respectively. In terms of the contribution of the Ministry of Finance's debt to domestic public debt, it reached 4.6% and 4.5%, respectively. The total treasury transfers to commercial banks and the central bank also decreased from 28,413,167 to 26,003,304 million dinars, with negative annual growth rates of -12% and -8.4%, respectively, and contribution rates of 68% and 67.9% for the years 2018 and 2019. Furthermore, loans from financial institutions also decreased for these two years from 9,501,043 and 8,651,508 million dinars, with negative annual growth rates of -9.9% and -8.9%, respectively , Its contribution to the domestic public debt reached (22.8%) and (22.6%) respectively. As for government bonds, they also decreased during the mentioned two years from (1,953,189) to (1,921,217) million, with negative annual growth rates of (27.1%) and (1.6%) respectively, and a contribution rate of (4.6%) and (5%) respectively for the years 2018 and 2019. The decline in the aforementioned figures for these

[9] Republic of Iraq, Central Bank of Iraq, Directorate General of Statistics and Research, Annual Economic Report for the years 2015 and 2016, pp. 76-61.

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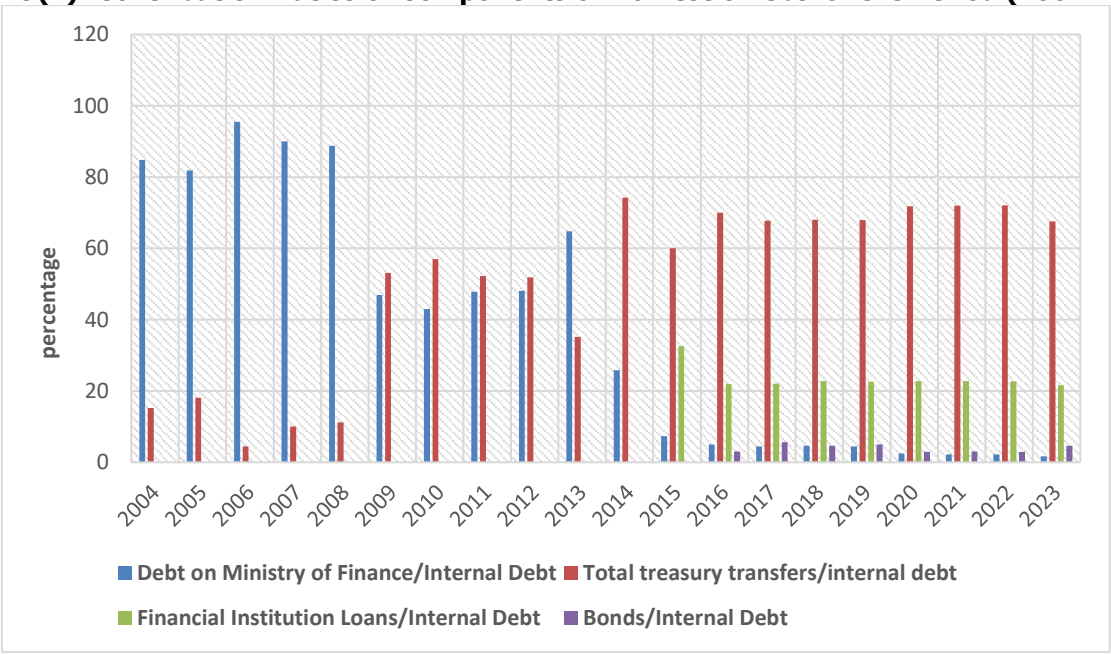
two years is attributed to the improvement in the security and economic conditions in Iraq, as well as the reduction in military spending, alongside the increase in oil revenues due to rising oil prices and consequently the increase in general revenues in the budget.

In the years 2020-2023, the domestic public debt rose again from (64,246,559) to (70,557,515) million dinars respectively, with positive annual growth rates of (67.6%) and (1.5%) respectively (excluding the year 2020). This increase is due to the rise in the total treasury transfers to commercial banks and the central bank from (46,106,011) to (50,296,123) million dinars respectively in the years 2020 and 2021, with positive annual growth rates of (77.3%) and (9%) respectively, but they declined in the years 2022 and 2023. Additionally, the item for loans from financial institutions saw an increase from (14,668,508) to (15,962,934) million dinars respectively, with positive annual growth rates of (69.5%) and (8.8%) respectively in the years 2020 and 2021, but declined in the years 2022 and 2023. The contribution rate of loans from financial institutions did not change from the beginning of 2016 to 2022 but decreased to (21.6%) in 2023. Regarding the bonds item, there was an increase of (2,097,818) million dinars in 2021 compared to 2020 , The annual growth rate reached (9.4%) in 2021, and the contribution of bonds to the domestic public debt was (2.9%) and (3%) respectively for the years 2020 and 2021, then it rose in 2023 to (62.0%). As for the remaining debt balance owed by the Ministry of Finance, there was a decrease in favor of the Central Bank, as it amounted to (1,555,519) million in 2020, with a negative annual growth rate of (11.3%) for the same year, while there was no change in the debt balance in 2021 compared to 2020. This increase in domestic public debt is attributed to a decline in public revenues due to falling oil prices and the Corona pandemic, which prompted the government to resort to domestic borrowing to reduce the budget deficit gap under the approval of the Internal and External Borrowing Law No. (5) of 2020, which authorized the Minister of Finance to borrow internally and externally, in addition to the issuance of Article (3) of the Financial Deficit Financing Law of 2020, under which the Ministry of Finance was financed with an amount of (12) trillion Iraqi dinars through the secondary market. It is noteworthy that more than (55%) of commercial bank deposits are deposits of the central government and public institutions, and (57.1%) of them are held by the monetary authority. Therefore, the measures that the government will take in the future to settle these debts will be conducted within the governmental apparatus.[10] Based on the above, the contribution ratios of the structure of domestic debt to the total domestic debt can be illustrated in Chart (1) for the period (2004-2023).

Chart (1): Contribution Ratios of Components of Domestic Debt for the Period (2004-2021)



[10] Republic of Iraq, Central Bank of Iraq, Directorate General of Statistics and Research, Iraqi Economic Outlook Report (Third Semester 2021), p. 29.

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Source: Prepared by the researcher based on Table (1).

Requirement Two: Analysis of the Structure of Gross Domestic Product

The structure of the economic sectors of the gross domestic product can be analyzed as follows:

First: Analysis of Commodity Sectors

Table (2) shows the commodity sectors of the Gross Domestic Product (GDP). We notice that the commodity sectors increased from 2004 to 2008, reaching (36,348,004.5) million dinars in 2004 and (103,219,366.4) million dinars in 2008, with positive annual growth rates of (43.3%) in 2008. In terms of the contribution of commodity sectors to GDP, it reached (68.8%) and (66.2%). This increase is attributed to agricultural land reform, increased oil exports, and rising public revenues. The year 2009 witnessed a decline in total commodity sectors and GDP, with a negative annual growth rate of (-28.5%) and (-16.8%). In terms of the contribution of commodity sectors to GDP, it reached (57%). This decline is attributed to the global financial crisis of 2008 and falling oil prices. The years 2010, 2011, 2012, and 2013 saw an increase in commodity sectors and GDP, with annual growth rates ranging from (32.5%) to (7.6%). Meanwhile, the contribution of commodity sectors to GDP increased to between (61%) and (62%), attributed to rising oil revenues. However, the years 2014 and 2015 saw a decline in commodity sectors, reaching (159,500,679.8) million dinars in 2014 and (94,907,634.1) million dinars in 2015, with negative annual growth rates of (-6.0%) and (-40.4%). There was also a noticeable decrease in GDP, which reached (266,332,655.1) million dinars in 2014 and (194,680,971.8) million dinars in 2015, with annual growth rates of (-2.6%) and (-26.9%). In terms of the contribution of commodity sectors to GDP, it reached (60.1%) and (49%), with this decline attributed to security and political instability, as well as falling oil prices. The years 2016 to 2023 witnessed an increase in the total commodity sectors (except for 2020 and 2023, due to the Corona pandemic and the decline in oil prices), while the contribution of commodity sectors to GDP reached between (50.2%) and (65.6%) This increase is due to the world's recovery from the Covid-19 crisis as well as the rise in oil prices. The years 2016 to 2023 witnessed an increase in the total commodity sectors (except for the years 2020 and 2023, due to the COVID-19 pandemic and the drop in oil prices), while the contribution of the commodity sectors to GDP ranged between (50.2%) and (65.6%). This increase is attributed to the world's recovery from the COVID-19 crisis, as well as the rise in oil prices .

Secondly: Analysis of the Structure of Distribution Sectors

We observe from Table (2) that there was a gradual increase in the distribution sectors from 2004 to 2014, with an annual growth rate ranging between (36.7%) and (2.2%). In terms of the contribution of the distribution sectors to GDP, it ranged between (20.8%) and (29.2%) in the years 2004 and 2015. This increase is due to rising oil prices and increased revenues, which helped improve trade and services. However, the year 2015 saw a decline in both the distribution sectors and GDP, with an annual growth rate in the negative (%-5.0) and (%-26.9), while the contribution of the distribution sectors to GDP was (29.2). This decline is attributed to security and political instability, as well as falling oil prices, which led to a reduction in government spending on distribution sectors. The years 2016, 2017, and 2018 experienced an increase in the total distribution sectors, with annual growth rates of (0.2%), (5.4%), and (12.9%), while the contribution of the distribution sectors to GDP was (29.0%), (26.7%), and (25.3%). The years from 2019 to 2023 saw a decline (except for the year 2021), with annual growth rates ranging between (3.5-%) and (2.9-%).

As for the contribution of the distribution sectors to GDP, it ranged between (23.7%) and (19.6%) This decline is attributed to the COVID-19 crisis, which led to a decrease in oil prices as well as a reduction in spending on infrastructure .

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ratio /1	ratio /1	ratio /1	Annual	Total Service Sectors	Annual	Total Distribution	Annual	Total Commodity	Annual	Gross Domestic Product	Years

Table (2): Analysis of GDP for the "Commodity, Distribution, and Service" sectors and their percentages in Iraq for the period (2004-2023) million dinars .

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7	5	3				Sectors		Sectors		(GDP)	
11	10	9	8	7	6	5	4	3	2	1	
10.3	20.8	68.8	-5	5520751.8	-1	11102722.1	-1	36348004.5	-3	53235358.7	2004
8.8	20.6	70	17.9	6511223.5	36.7	15184646.3	131.5	51460239.2	38.1	73533598.6	2005
11.2	21.5	67	64.7	10726238.4	35.3	20559484.2	24.0	63823026.3	29.9	95587954.8	2006
12.8	22.1	64.5	33.3	14302388.3	19.9	24665675.2	12.7	71982333.4	16.6	11145581 3.4	2007
14.9	18.4	66.2	63.6	23410748.4	17.4	28978424.2	43.3	10321936 6.4	40.8	15702606 1.6	2008
18.2	24.5	57	1.8	23843822.1	10.5	32045697.4	28.-5	73764671.2	-16.8	13064320 0.4	2009
27.8	22.3	61	89.6	45209794.6	13.0	36238444.3	32.5	97747544.2	24	16206456 5.5	2010
14.0	18.8	67	-32.4	30518824.6	13.0	40956144.6	47.8	14456141 1.1	34	21732710 7.4	2011
14.7	20.5	64.9	22.8	37488456.8	27.5	52249938.2	12.7	16298551 7.8	16.9	25422549 0.7	2012
19.0	21.4	62	38.9	52076259.6	12.3	58722131.2	4.1	16972433 3.3	7.6	27358752 9.2	2013
17.2	22.5	60.1	-11.9	45836270.9	2.2	60065571.3	6.0-	15950067 9.8	-2.6	26633265 5.1	2014
21.1	29.2	49	-10.0	41229609.7	-5.0	57021677.5	40.-4	94907634.1	-26.9	19468097 1.8	2015
20.8	29.0	50.2	-0.5	40985235.6	0.2	57162363.3	2.1	96926315.0	1.1	19692414 1.7	2016
18.1	26.7	53.1	0.07	41013254.3	5.4	60273768.3	21.1	11740807 3.7	14.6	22572237 5.5	2017
17.6	25.3	56.3	16.0	47583378.2	12.9	68090031.0	27.8	15008045 0.2	19.1	26891887 4.0	2018
19.3	23.7	56.2	12.2	53410202.3	3.5-	65670695.0	2.2	15347719 5.0	2.6	27615786 7.6	2019
24.5	28.2	47	0.8	53873498.0	5.4-	62090759.6	34.-5	10045429 3.5	-20.4	21976879 8.4	2020
17.7	25.7	57.1	-0.7	53448670.7	24.9	77564529.5	73.3	17417817 7.7	37.1	30143953 3.9	2021
15.1	19.6	65.6	8.5	57996878.2	2.9-	75266402.6	44.2	25129194 1.8	27	38306415 2.3	2022
238.	181.	580.	367.	79310700.0	20.-0	60154100.0	23.-3	19270990 0.0	13.-2	33217470 0.0	2023
173.	22.9	600.	متوسط النسب								

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Source: Prepared by the researcher based on the Ministry of Planning, Central Statistical Organization, National Accounts Directorate for the years (2004-2023).

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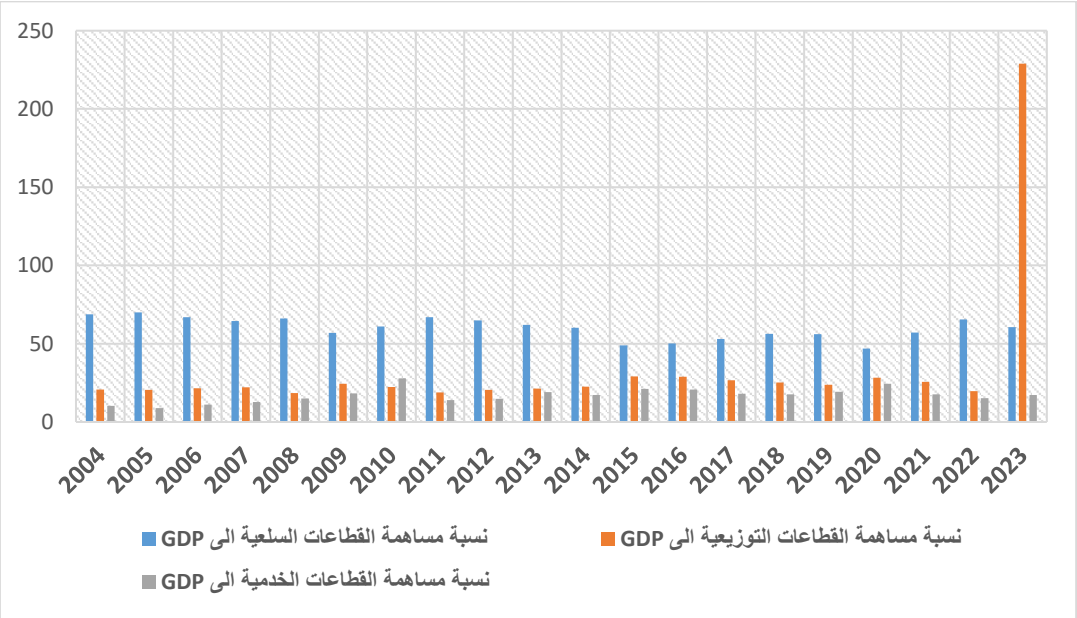
Third: Analysis of the Structure of Service Sectors

We observe from the table itself that there has been an increase in the service sectors from 2004 to 2010, with an annual growth rate ranging between (17.9%) and (89.6%). As for the contribution of the service sectors to GDP, it ranged between (10.3%) and (27.8%). This increase is attributed to the relative security and political stability and the rise in Iraqi government revenues from oil exports, which led to increased spending on public services. The year 2011 saw a decline in the service sectors, reaching (30,518,824.6) million dinars with a negative annual growth rate of (-32.4%). In terms of the contribution of the service sectors to GDP, it was (%14.0). This decline is due to security and political instability and weak infrastructure, which hindered the growth of some service sectors, such as tourism. The years 2012 and 2013 witnessed an increase in the service sectors, with annual growth rates of (%22.8) and (%38.9). In terms of the contribution of the service sectors to GDP, it reached (14.7%) and (19.0%). This increase is attributed to rising oil prices, which in turn led to increased government revenues, prompting the Iraqi government to increase spending on infrastructure projects and public services. Meanwhile, the years 2014, 2015, and 2016 experienced a decline in the service sectors, with annual growth rates of (-11.9%), (-10.0%), and (-0.5%). Regarding the contribution of the service sectors to GDP, it was (%17.2), (21.1%), and (20.8%). This decline is attributed to security and political instability, falling oil prices, as well as weak infrastructure, skill shortages, bureaucracy, and corruption. The years from 2017 to 2023 saw an increase in the service sectors (except for the year 2021). In terms of the contribution of the service sectors to GDP, it reached (%18.1) and (%15.1), This rise is due to a recovery from the Covid-19 crisis, as well as rising oil prices, increased spending on public services, and the beginning of reconstruction of liberated areas.

Figure (2) shows the ratios of the contribution of the three economic sectors to the GDP.



Source: Prepared by the researcher based on Table (7).

The third requirement: Analysis of government spending on education and health

We notice from Table (3) that spending on education decreased in 2005 to (1,612,644) million dinars compared to 2004, with a negative annual growth rate of (6.1%), due to the war that Iraq faced after 2003 and the decline in the country's public revenues. In the years from 2006 to 2013, spending on education increased from (2,074,219) million dinars to (10,574,821) million dinars, with positive annual growth rates of (28.6%) and (11.3%) respectively. This was due to the increase in oil revenues as a result of rising oil prices, and consequently, an increase in public revenues, which led to an increase in public expenditures during those same years, along with an increase in budget allocations for the education sector. In 2014 and 2015, spending on education decreased from (9,936,750) million dinars to (9,312,073) million dinars, with negative annual growth rates of (6%) and (6.2%) respectively. This was attributed to the events of the war that Iraq experienced, which affected most Iraqi provinces, followed by a decline in oil revenues and subsequently a decrease in public expenditures. In the years from 2016 to 2019, spending on education increased from (9,732,368) million dinars to (12,424,790) million dinars, with positive annual growth rates of (4.5%) and (4.7%)

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respectively, due to the gradual improvement in the country's security situation and the subsequent rise in oil revenues, leading to an increase in budget allocations for some sectors, including the education sector.

As for the years from 2020 to 2022, spending on education declined from (10,396,270) million dinars to (5,516,924) million dinars, with negative annual growth rates of (16.3%) and (46.7%) respectively. This was attributed to the two crises that the world faced, including the Iraqi economy, namely the Corona crisis and the crisis of falling oil prices.

Proportion of expenditure on health	ن Expenditure on education is a total public expenditure	Total public expenditure	Annual growth rate	Public expenditure on health	Annual growth rate	Expenditure on education	Years
7	6	5	4	3	2	1	
3.3	5.3	32117491.3	....	683529.5	....	1717932	2004
3.5	6.1	26375175.1	63	1116137	-6.1	1612644	2005
3.9	5.3	38806679.3	0.002	1116164	28.6	2074219	2006
7.4	6.3	39031232.2	46.21	1632017	19.4	2476727	2007
4.2	8.8	59403374.7	77.61	2898667	112.4	5262624	2008
5	10.1	55589721	17.54	3407138	7.3	5650308	2009
4.8	9.6	70134201	22.31	4167602	20	6784298	2010
4.9	10	78757667	2.77	4283434	17	7941936	2011
4.4	9	105139575	14.88	4921087	19.5	9497101	2012
5.3	8.8	119127556	27.46	6272867	11.3	10574821	2013
4.8	8.8	112192126	-54.92	2827721	-6	9936750	2014
4.6	11.2	82813611	39.0	5404272	-6.2	9312073	2015
4.7	13.2	73571003	41.1	5044804	4.5	9732368	2016
4.8	13.7	75490115	48.2	3834515	6.5	10373294	2017
4.5	14.6	80873189	13.1	4302670	14.3	11856906	2018
5.6	11.1	111723523	46.5	6306218	4.7	12424790	2019
7.5	13.6	76082443	-8.6	5757693	-16.3	10396270	2020
7.2	10	102849659	30	7485283	-0.2	10367901	2021
7	4.7	116959582	10	8235590	-46.7	5516924	2022
6	2	142435636	4	8568077	-49.1	2806705	2023
5.17	9.11						متوسط النسبة

Table 3: Public expenditure on education and health in Iraq for the period 2004-2023 million dinars
Source: Prepared by the researcher based on: Data of the Ministry of Planning, Central Statistical Organization, Directorate of National Accounts (2004-2023).

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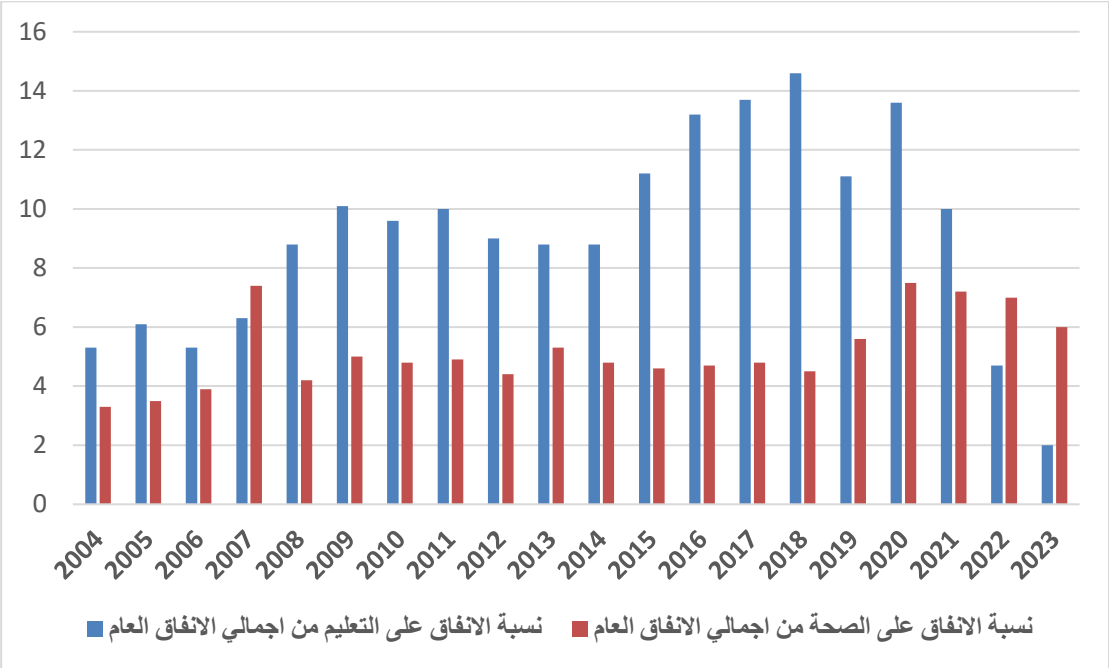
Regarding public spending on health, Table (3) shows that in 2004, financial allocations for the health sector began to rise significantly, as these public expenditures increased from (683,529.5) million dinars in 2004 to about (1,116,137) million dinars in 2005, with an annual growth rate of (63%) In 2013, these expenditures reached (6,272,867) million dinars, decreasing in 2015 to (5,404,272) million dinars, and reaching (4,302,670) million dinars in 2018 due to the circumstances the country faced from wars against terrorism. After that, it increased in 2019 to (6,306,218) million dinars, with a positive annual growth rate of (46.5%), due to increased public spending on the health sector and the reconstruction of some hospitals, as well as increased imports of medicines and medical supplies. In 2020, public spending on health decreased to (5,757,693) million dinars, with a negative annual growth rate of (8.6%), attributed to the two crises that the Iraqi economy faced, namely the (COVID-19 pandemic crisis and the drop in oil prices). In 2021 and 2022, public spending on health increased to (8,235,590) million dinars in 2022, with a positive annual growth rate of (10%), resulting from the gradual improvement in oil prices and recovery from the COVID-19 pandemic. In terms of the percentage contribution of public spending on health to total public spending, it ranged from (3.3%) in 2004 to (7%) in 2022. As for the percentage contribution of public spending on education to total public spending, it ranged between (4.7%) in 2022 and (13.6%) in 2020. Figure (3) illustrates the contribution rates of spending on education and health from total public expenditures.

Figure (3): The percentage of spending on education and health from total public expenditures for the period 2004-2023



Source: Prepared by the researcher based on Table (3)

Chapter Three

Measuring and Analyzing the Impact of Domestic Government Debt on Some Sustainable Development Indicators in Iraq

Section One: Description of the Variables Used in the Standard Model

In this section, the independent variable and the dependent variables of the research will be described, in addition to supporting the variables with mathematical equations, in order to prove the validity of the research hypothesis and to achieve its main objective. Furthermore, to support the results reached in the second chapter, what has been presented will be described in the following paragraphs as follows:

First: Independent variable:

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•Government internal debt: This is the total amount owed by the government to local creditors, including loans and bonds issued by the government to finance the budget deficit or its projects.

Second: Dependent variable:

•Gross Domestic Product (GDP): This is the market value of all final goods and services produced within the borders of a country during a specific time period, usually a year, and is considered a key indicator for measuring the size of the economy.

•Government spending on education: This is the amount allocated by the government for developing and providing educational services, including "building schools, paying teachers' salaries, and providing curricula, etc".

•Government spending on health: This is the money spent by the government on providing health services, such as "building hospitals, providing medicines, and covering healthcare costs for citizens, etc".

In light of the above, a table can be included that illustrates the symbols used for the independent variables and the dependent variable in the ARDL model.

Table (4): Study variables in terms of (name, type, and symbol used) in the ARDL model

NO.	Variable Name	Variable type	The code used l
1	**Internal Government Debt**	Independent variable	DG
2	**GDP**	Dependent variables	GDP
3	**Government Spending on Education**		GS
4	**Government Expenditure on Health**		GH

Source: Prepared by the researcher based on the previous explanation.

Based on the above, the variables mentioned can be formulated in the following linear equations:

GDP = f (DG) .....(1)
GDP = ß₀ + ß₁ DG + Ui ..... (2)
where: GDP: Dependent vari*able.* ***B0 :*** fixed limit***. (ß1)*** pa dent variable***. (DG) :*** .independent variable. ***UI*** : Random error limit

Equations of the first model

GS = f (DG) .....(3)
GS = ß₀ + ß₁ DG + Ui ..... (4)
.Whereas: GS: Dependent variable

Equations of the second model

GH = f (DG) .....(5)
GH = ß₀ + ß₁ DG + Ui ..... (6)

where: GH: dependent variable.

Equations of the third model

Section Two: Results of the Time Series Stationarity Te n (P-P)

It is clear from Table (5) the results of the (PP) test across three cases: (Intercept only, Trend and intercept, None). Therefore, Table (5) shows that the variables (DG, GDP, GS, GH) are all non-stationary at Level I(0) in all cases, as their p-values exceeded the 5% level. Here, we must reject the alternative hypothesis and accept the null hypothesis. Subsequently, it is necessary to take the first difference I(1) of these variables. It was found that after taking the first difference, the same variables became stationary in the first difference since the p-value is below 5%, except for the GDP variable, which is non-stationary in the case of Trend and intercept. Thus, generally, it can be stated that we should accept the alternative hypothesis and reject the null hypothesis after the stationarity of those variables.

Table (8): Results of the (PP) Test

Variables	Level I(0)			Ist difference I(1)		
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
	Prob	Prob	Prob	Prob	Prob	Prob
DG	0.9517	0.7180	0.9395	0.0434	0.1412	0.0159
GDP	0.5231	0.3752	0.8609	0.0409	0.1406	0.0038

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GS	**0.5973**	**1.0000**	**0.4884**	**0.0675**	**0.0582**	**0.0151**
GH	**0.8020**	**0.3636**	**0.9473**	**0.0029**	**0.0173**	**0.0002**

Source: Prepared by the researcher using the (Eviews 12) program.

Section Three: Results of the ARDL Model

In this section, the results of the ARDL model will be presented and discussed to estimate the relationship function between the independent variable and the dependent variables. This will be done through several models:

Model One: Estimating the Relationship Function between Domestic Government Debt and Gross Domestic Product

First: Preliminary Estimation Test for the ARDL Model: Table (6) shows that the ARDL model automatically determines the optimal lag length for the two variables (DG, GDP). The lag length for the dependent variable, which is the GDP, is three lags, while the lag lengths for the independent variable, which is domestic government debt, is three slow time periods as well. On the other hand, the statistical results showed that the independent variable explained that the value of the Adjusted R-Squared (AR-S) coefficient reached (0.98%) in the change occurring in the dependent variable GDP, attributed to the change occurring in the independent variable, while the remainder of about (0.2%) is due to random error.

Table (6): Results of ARDL Model Test

Selected Model: ARDL(3, 3)				
Prob.*	t-Statistic	Std. Error	Coefficient	Variable
0.0000	12.51461	0.151001	1.889715	GDP(-1)
0.0000	-5.603834	0.292307	-1.638041	GDP(-2)
0.0005	3.940033	0.185143	0.729468	GDP(-3)
0.0000	-5.675729	0.682382	-3.873015	DG
0.0001	4.699402	1.607607	7.554791	DG(-1)
0.0090	-2.801644	1.963945	-5.502273	DG(-2)
0.0757	1.842013	1.059159	1.950985	DG(-3)
0.0839	1.790126	3008040.	5384772.	C
1.11E+08	Mean dependent var		0.985011	R-squared
39609224	S.D. dependent var		0.981393	Adjusted R-squared
34.03160	Akaike info criterion		5402942.	S.E. of regression
34.37990	Schwarz criterion		8.47E+14	Sum squared resid
34.15439	Hannan-Quinn criter.		-621.5845	Log likelihood
1.834873	Durbin-Watson stat		272.2561	F-statistic
			0.000000	Prob(F-statistic)

Source: Prepared by the researcher based on the program (Eviews 12)

As for the calculated F value, it is statistically significant because its probability value is less than the 5% level, reaching (0.00000), which explains the statistical significance of the model as a whole. It should also be noted that the Durbin-Watson (D-W) statistics indicate that its value reached (1.834873), which shows that the model is free from false regression problems.

Second: Bounds Test for Cointegration

Cointegration between the independent variable DG and the dependent variable GDP is verified by comparing the calculated F value with the upper bound I(1) and the lower bound I(0). If the calculated F value is greater than the upper bound I(1), the alternative hypothesis should be accepted, which states that (there is cointegration and a long-term equilibrium relationship between the variables, rejecting the null hypothesis). Conversely, if the F value is

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less than the lower bound I(0), the null hypothesis should be accepted, rejecting the alternative hypothesis which states (there is no cointegration among the variables). If the F value falls between the upper and lower bounds, the result is ambiguous and inconclusive for decision-making, as shown in Table (7).
Table (7) shows that the calculated F value of (8.32) is higher than the upper critical value of (1.16) and the lower critical value of (3.62) at the significance level (5%). This indicates that there is a cointegration and a long-term equilibrium relationship between the independent variable and the dependent variable, and thus we accept the alternative hypothesis and reject the null hypothesis .

Table (7): Results of the Bounds test 7

Null Hypothesis: No levels relationship			F-Bounds Test	
I(1)	I(0)	Signif.	Value	Test Statistic
3.51	3.02	10%	8.321885	F-statistic
4.16	3.62	5%	1	k
4.79	4.18	2.5%		
5.58	4.94	1%		

Source: Prepared by the researcher using the (Eviews 12) program.

Third: Estimation of short-term parameters and unrestricted error correction model (UECM)

This test illustrates the effect of the independent variable on the dependent variable in the short term, as well as determining the type of relationship between these two variables. This test also shows the unrestricted error correction model (UECM) that measures the speed of return of the model to equilibrium in the long term between the independent and dependent variables in the case of divergence and deviation occurring in the short term. One of the conditions for UECM is that it should be negative and significant; if this condition is met, then the model approaches a state of long-term equilibrium. Conversely, if it is, for example, positive and significant, or negative and not significant, or otherwise, then the model does not achieve equilibrium. Table (8) presents the results of the estimation in the short term for the time lags. This can be clarified (statistically and economically) below

Table (8): Results of short-term parameter estimation

ECM Regression Case 2: Restricted Constant and No Trend				
Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0000	6.921187	0.131274	0.908573	D(GDP(-1))
0.0000	-4.825649	0.151165	-0.729468	D(GDP(-2))
0.0000	-6.427026	0.602614	-3.873015	D(DG)
0.0013	3.571711	0.994282	3.551288	D(DG(-1))
0.0430	-2.116221	0.921919	-1.950985	D(DG(-2))
0.0015	-3.503569	0.005382	-0.018858	CointEq(-1)*

Source: Prepared by the researcher using the (Eviews 12) program.

Table (8) shows the effect of the independent variable DG on the dependent variable GDP in the short term, as it indicates that there is an inverse effect of domestic government debt on GDP at the time lags D(DG) and D(DG(-2)). At two significance levels of (0.0000) and (0.0430), this means that an increase in domestic government debt by one unit will lead to a decrease in GDP by (3.87%) and (1.95%) respectively. This inverse effect may be due to the fact that an increase in government debt in the short term leads to a decrease in private investments or an increase in expected future taxes, which reduces consumption and investment spending in the economy. This can weaken economic growth and lead to a decline in GDP.

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As for the time lag D(DG(-1)), it shows the positive effect of DG on GDP, at a significance level of (0.0013), meaning that an increase in domestic government debt by one unit will lead to an increase in GDP by (3.55%). This positive effect may reflect that an increase in government debt in a previous period (like last year) was used to finance infrastructure projects or public investments that stimulated economic growth in the current period. In other words, government debt may have contributed to increased public spending that led to an increase in aggregate demand in the economy. In other words, part of the government debt may be directed towards financing development projects or rebuilding infrastructure that was damaged due to wars or conflicts.

Based on the above, Table (8) also illustrates, from another perspective, the unrestricted error correction term UECM, which has a value of (-0.018858), negative and significant at a probability value (Prob=0.0015), which confirms the existence of a short-term equilibrium relationship between the independent variable DG and the dependent variable GDP towards a long-term equilibrium relationship.

This means that the unrestricted error correction model (UECM) explains that approximately (0.018%) of short-term errors in GDP for the previous period (t-1) can be corrected in the current period (t) in order to return to long-term equilibrium when a shock or any change occurs in the independent variable .

Fourth: Testing the estimated parameters in the long term

This test also shows the effect of the independent variable on the dependent variable, but in the long term, and it clarifies the type of relationship between these two variables. Table (9) illustrates this .

Table (9): Results of estimating long-term parameters

Levels Equation Case 2: Restricted Constant and No Trend				
Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0027	3.231754	0.707290	2.285788	DG
0.0000	5.486601	14146960	77618730	C

Source: Prepared by the researcher based on the Eviews 12 program.

Table (9) shows that there is a positive effect of DG on GDP, with a significance level of (0.0027). This means that an increase in domestic government debt by one unit will lead to an increase in gross domestic product by (2.28%). This positive effect in the long term corresponds with the short term at the time lag D(DG(-1)), and the same reasoning can be attributed to the use of debt in financing public expenditures, leading to an increase in aggregate demand .

Fifth: Diagnostic tests for residuals

To ensure the validity and accuracy of the results obtained in the previous tests, we will conduct some diagnostic tests to prove this, as follows :

1- Test for autocorrelation problem

This test is used to ensure that the estimated model is free from the problem of autocorrelation of the residuals. Table (10) illustrates this .

Table (10): Results of the LM autocorrelation problem test

Breusch-Godfrey Serial Correlation LM Test:

0.3159	**Prob. F(2,20)**	**1.221293**	**F-statistic**
0.1572	**Prob. Chi-Square(2)**	**3.700462**	**Obs*R-squared**

Source: Prepared by the researcher using the program (Eviews 12(

Table (10) reveals the results of the autocorrelation problem test, where we observe that the calculated F value's probability (Prob=0.3159) is greater than the level (5%), indicating that there is no autocorrelation problem.

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Therefore, the null hypothesis, which states that there is no autocorrelation problem among the random residuals, should be accepted, and the alternative hypothesis should be rejected .

2- Test for Heteroscedasticity Problem

This test is used to ensure that the estimated model is free from the problem of heteroscedasticity of the residuals, as shown in the table

.

Table (11): Results of the Heteroscedasticity Problem Test (ARCH)

Heteroskedasticity Test: ARCH

0.8491	Prob. F(1,31)	0.036788	F-statistic
0.8432	Prob. Chi-Square(1)	0.039115	Obs*R-squared

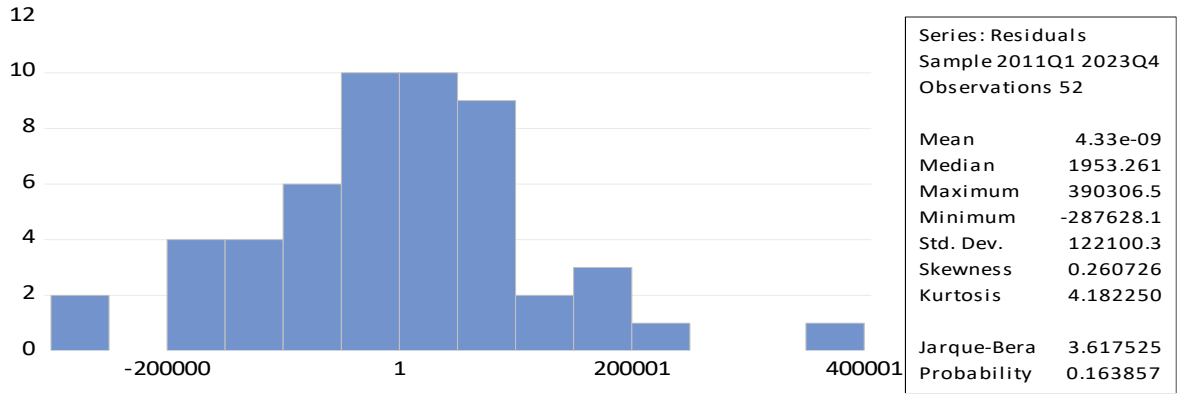
Source: Prepared by the researcher using the program (Eviews 12)

Table (11) shows the results of the heteroscedasticity problem test (ARCH), where we observe that the calculated F value's probability (Prob=0.8491) is greater than the level (5%), indicating that there is no heteroscedasticity problem. Therefore, the null hypothesis, which states that there is no problem of heteroscedasticity among the random residuals, should be accepted, and the alternative hypothesis should be rejected .

3- Normality Distribution Test (Histogram-Normality Test)

This test is used to ensure that the estimated model is free from the normality distribution problem of the residuals. Figure (12) illustrates this .

Figure (4): Results of the Normality Distribution Problem Test



Source: Prepared by the researcher using the program (Eviews 12(

Figure (4) shows the results of the normality distribution problem test (Jarque-Bera), where we observe that its probability value (Prob=0.163857) is greater than the level (5%), indicating that there is no problem with normal distribution. Therefore, we should accept the null hypothesis, which states that there is no problem with normal distribution.

4. Structural Stability Test for the ARDL Model

This test is used to verify the stability of the ARDL model by using the cumulative sum of the estimated residuals in the CUSUM chart. The structural stability of the model parameters is confirmed if the blue line (wavy) falls within the critical boundaries marked by the red dots at the 5% level. Conversely, if the blue line falls outside the critical boundaries, the structural stability of the model is not achieved. The figure below illustrates this.

Figure (5): Results of the Structural Stability Test for CUSUM

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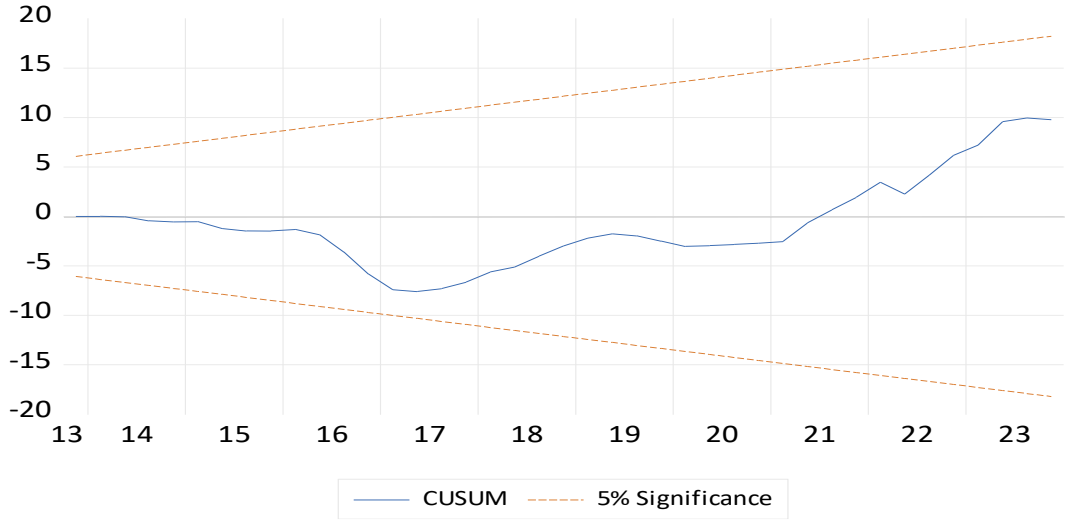

Source: Prepared by the researcher using Eviews 12.

Figure (5) shows the results of the structural stability test for CUSUM. We observe that the blue line in the figure lies within the critical boundaries marked by the red dots, indicating that the estimated parameters of the model are stable.

Second Model: Estimating the Relationship Function between Domestic Government Debt and Education Spending

First: Preliminary Estimation Test for the ARDL Model: Table (12) illustrates that the ARDL model automatically determines the optimal lags for the variables (DG, GS). The lag degree for the dependent variable, which is government spending on education (GS), is four lag periods, while the lag degrees for the independent variable, which is domestic government debt, are also four lag periods. On the other hand, statistical results showed that the independent variable explained that the value of the adjusted R-squared (AR-S) coefficient reached (0.98%), indicating that the change in the dependent variable (GS) is attributed to the change in the independent variable, and that approximately (0.2%) is due to random error.

Table (12): Results of the ARDL Model Test

Selected Model: ARDL(4, 4)				
Prob.*	t-Statistic	Std. Error	Coefficient	Variable
0.0000	14.00940	0.148890	2.085854	GS(-1)
0.0000	-6.177304	0.301842	-1.864569	GS(-2)
0.0004	4.017571	0.305589	1.227724	GS(-3)
0.0066	-2.952533	0.159993	-0.472384	GS(-4)
0.0022	-3.388475	0.026027	-0.088190	DG
0.0094	2.802970	0.060950	0.170842	DG(-1)
0.3997	-0.856147	0.081405	-0.069695	DG(-2)
0.3179	-1.018364	0.070237	-0.071527	DG(-3)
0.0778	1.836413	0.030232	0.055519	DG(-4)
0.0989	1.711456	91904.61	157290.7	C
3971834.	Mean dependent var		0.988760	R-squared
1624750.	S.D. dependent var		0.984869	Adjusted R-squared
27.47870	Akaike info criterion		199854.5	S.E. of regression
27.91857	Schwarz criterion		1.04E+12	Sum squared resid
27.63222	Hannan-Quinn criter.		-484.6166	Log likelihood

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1.375195	Durbin-Watson stat	254.1334	F-statistic
		0.000000	Prob(F-statistic)

Source: Prepared by the researcher based on the . (Eviews 12)

As for the calculated F value, it is statistically significant because its p-value is less than the 5% level, reaching (0.00000). This explains the significance of the model statistically as a whole. We should also note from the results of this table that the Durbin-Watson (D-W) statistics indicate that its value has reached (1.375195), which shows that the model is free from problems of spurious regression.

Secondly: Bounds Test

Table (13) shows that the calculated F value of (5.65) is higher than the upper bound value of (4.16) and the lower bound value of (3.62) at the 5% significance level, indicating that there is a co-integration and a long-term equilibrium relationship between the independent variable and the dependent variable; thus, we accept the alternative hypothesis and reject the null hypothesis.

Table (13): Results of the Bounds Test

Null Hypothesis: No levels relationship			F-Bounds Test	
I(1)	I(0)	Signif.	Value	Test Statistic
3.51	3.02	10%	5.654891	F-statistic
4.16	3.62	5%	1	k
4.79	4.18	2.5%		
5.58	4.94	1%		

Source: Prepared by the researcher based on the . (Eviews 12)

Thirdly: Estimation of Short-Term Parameters and Unrestricted Error Correction Model (UECM)

Table (14) illustrates the effect of the independent variable DG on the dependent variable GS in the short term. The table shows that there is an inverse effect of domestic government debt on education spending at the lagged periods D(DG) and D(DG(-2)), with significance levels of (0.0001) and non-significance (0.0850), respectively. This means that an increase in domestic government debt by one unit will lead to a decrease in education spending by (0.09-%) and (0.04-%) respectively. This may reflect financial pressures that lead to a reduction in education spending to meet debt obligations or to reallocate resources to other priorities.

Table (14): Results of Short-Term Parameter Estimation

ECM Regression Case 2: Restricted Constant and No Trend				
Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0000	8.875065	0.131080	1.163340	D(GS(-1))
0.0000	-6.118869	0.151811	-0.928912	D(GS(-2))
0.0001	4.784176	0.122147	0.584374	D(GS(-3))
0.0001	-4.432881	0.022467	-0.099594	D(DG)
0.0006	3.865846	0.033091	0.127927	D(DG(-1))
0.0850	-1.788258	0.026321	-0.047069	D(DG(-2))
0.0544	-2.011336	0.009861	-0.019835	CointEq(-1)*

Source: Prepared by the researcher based on the . (Eviews 12)

As for the time lag D(DG(-1)), it shows the positive effect of DG on GS, with a significance level of (0.0006). This means that an increase in domestic government debt by one unit will lead to an increase in spending on education by (0.12%). This may reflect an expansionary policy aimed at increasing spending on education as part of economic stimulus.

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Based on the above, Table (14) also illustrates, on another side, the unrestricted error correction term UECM, which has a value of (-0.019835), negative and significant at a probability value of (Prob=0.0544). This confirms the existence of a short-term equilibrium relationship between the independent variable DG and the dependent variable GS towards a long-term equilibrium relationship. This means that the unrestricted error correction term UECM explains that (0.01-%) of the short-term errors in GS from the previous period (t-1) can be corrected in the current period t in order to return to long-term equilibrium when a shock or any change occurs in the independent variable.

Fourth: Testing the estimated parameters in the long term

Table (15) shows that there is an inverse effect of DG on GS, with a significance level of (0.6598). This means that an increase in domestic government debt by one unit will lead to a decrease in spending on education by (0.36-%). The reason is that an increase in domestic government debt leads to the accumulation of significant financial obligations, forcing the government to reduce spending on developmental sectors like education to allocate resources for paying interest and debt obligations. In addition, an increase in debt may lead to higher borrowing costs in the future, limiting the government's ability to finance social and developmental programs, including education. . This creates a long-term adverse effect as spending on education is reduced to cope with the financial pressures resulting from debt accumulation.

Table 15: Results of estimating long-term parameters

Levels Equation Case 2: Restricted Constant and No Trend				
Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.6598	-0.444870	0.812455	-0.361436	DG
0.4619	0.745975	10935106	8157316.	C

Source: Prepared by the researcher based on the . (Eviews 12)

Fifth: Diagnostic Tests for Residuals

1. Autocorrelation Problem Test

Table (16) shows the results of the autocorrelation problem test, where we notice that the calculated F value's probability (Prob=0.6445) is greater than the level (5%), indicating no issue with autocorrelation. Therefore, we should accept the null hypothesis that states there is no autocorrelation problem among the random residuals and reject the alternative hypothesis.

Table 16: LM Autocorrelation Problem Test Results
Source: Prepared by the researcher based on the . (Eviews 12)

Breusch-Godfrey Serial Correlation LM Test:			
0.6445	Prob. F(5,19)	0.679254	F-statistic
0.3795	Prob. Chi-Square(5)	5.307557	Obs*R-squared

2. Variance Difference Problem Test

Table (17) presents the results of the variance difference problem test (ARCH), where we observe that the calculated F value's probability (Prob=0.6802) is greater than the level (5%), indicating no issue with variance differences. Therefore, we should accept the null hypothesis that states there is no variance difference problem among the random residuals and reject the alternative hypothesis.

Table (17): Results of the Variance Difference Problem Test (ARCH)

Heteroskedasticity Test: ARCH			
0.6802	Prob. F(1,32)	0.173069	F-statistic
0.6689	Prob. Chi-Square(1)	0.182896	Obs*R-squared

Source: Prepared by the researcher based on the . (Eviews 12)

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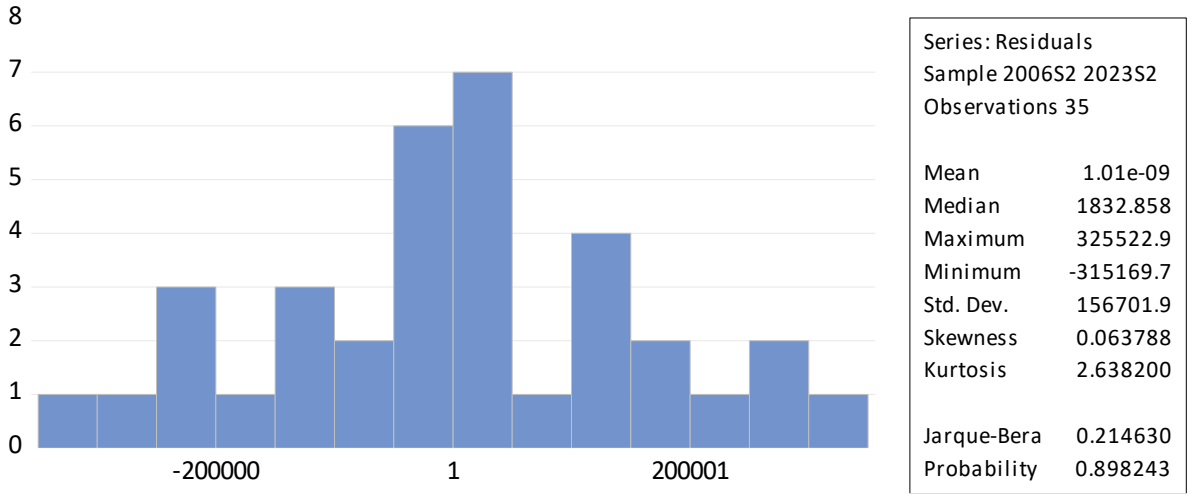
3. Normal Distribution Problem Test (Histogram-Normality Test)

Figure (6) illustrates the results of the normal distribution problem test (Jarque-Bera), where we notice that its probability value (Prob=0.898243) is greater than the level (5%), indicating no issue with normal distribution. Therefore, we should accept the null hypothesis that states there is no normal distribution problem for the residuals and reject the alternative hypothesis.

Figure (7): Results of the Normal Distribution Problem Test

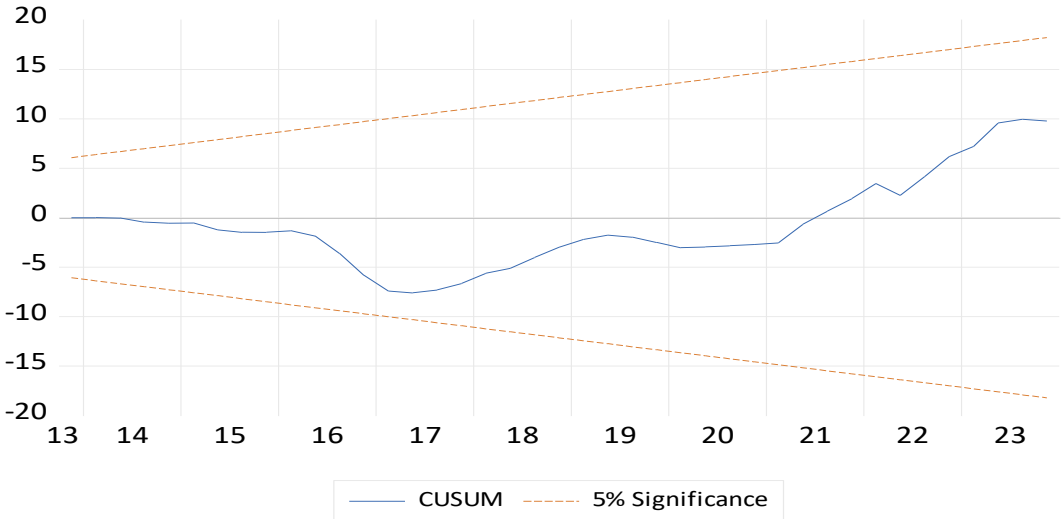


Source: Prepared by the researcher based on the . (Eviews 12)

4. Structural Stability Test for the ARDL Model

Figure (8) shows the results of the structural stability test (CUSUM), where we observe that the blue line in the figure lies within the critical boundaries marked in red, indicating that the estimated parameters of the model are stable.

Figure 8: Structural Stability Test Results for CUSUM



Source: Prepared by the researcher based on the . (Eviews 12)

Model Three: Estimating the Relationship between Domestic Government Debt and Health Expenditure

First: Testing the Initial Estimation of the ARDL Model: Table (18) shows that the ARDL model automatically determines the optimal lag length for the two variables (DG, GH), where the lag length for the dependent variable, which is government health expenditure (GS), is four lags, while the lag length for the independent variable, which is domestic government debt, is zero lags. On the other hand, the statistical results indicate that the independent variable explains that the value of the Adjusted R-Squared (AR-S) coefficient reached (0.92%), meaning that the

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change in the dependent variable (GH) is attributed to the change in the independent variable, while about (0.8%) is due to random error.

Table 18: ARDL Test Results

Selected Model: ARDL(4, 0)				
Prob.*	t-Statistic	Std. Error	Coefficient	Variable
0.0000	9.458340	0.174073	1.646443	GH(-1)
0.0000	-5.429978	0.287413	-1.560647	GH(-2)
0.0009	3.690194	0.287313	1.060240	GH(-3)
0.1336	-1.541888	0.174210	-0.268612	GH(-4)
0.1511	1.473352	0.005579	0.008220	DG
0.0687	1.888143	125502.1	236965.8	C
2401828.	Mean dependent var		0.939972	R-squared
1035540.	S.D. dependent var		0.929968	Adjusted R-squared
28.03096	Akaike info criterion		274041.7	S.E. of regression
28.29488	Schwarz criterion		2.25E+12	Sum squared resid
28.12308	Hannan-Quinn criter.		-498.5573	Log likelihood
1.767987	Durbin-Watson stat		93.95369	F-statistic
			0.000000	Prob(F-statistic)

Source: Prepared by the researcher based on the . (Eviews 12)

As for the calculated F value, it is statistically significant because its p-value is less than the 5% level, reaching (0.00000), which explains the statistical significance of the model as a whole. Additionally, we should note that the Durbin-Watson (D-W) statistics indicate that its value reached (1.767987), showing that the model is free from issues of spurious regression.

Second: Bounds Test for Cointegration

Table (19) shows that the calculated F value of (4.02) is higher than the upper bound value of (4.16) and the lower bound value of (3.62) at the 5% significance level, indicating that there is a cointegration and a long-term equilibrium relationship between the independent and dependent variables. Therefore, we accept the alternative hypothesis and reject the null hypothesis.

Table 19: Bounds test results

Null Hypothesis: No levels relationship		F-Bounds Test		
I(1)	I(0)	Signif.	Value	Test Statistic
3.51	3.02	10%	4.025948	F-statistic
4.16	3.62	5%	1	k
4.79	4.18	2.5%		
5.58	4.94	1%		

Source: Prepared by the researcher based on the . (Eviews 12)

Third: Estimating short-term parameters and the Unrestricted Error Correction Model (UECM)

Table (20) illustrates the effect of the independent variable DG on the dependent variable GH in the short term. The table shows a positive effect of domestic government debt on health spending at the time lag D(DG), with a non-significant level of (0.2548). This means that an increase in domestic government debt by one unit will lead to an increase in health spending by (0.06%). The reason for this is that the government may resort to increasing health spending as part of economic stimulus policies or to address urgent health needs, resulting in a temporary increase in spending despite rising debt.

Table 20: Results of estimating short-term parameters

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ECM Regression Case 2: Restricted Constant and No Trend				
Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0012	3.913612	0.148972	0.583019	D(GH(-1))
0.2548	1.181167	0.053549	0.063250	D(DG)
0.0651	-1.980804	0.091628	-0.181497	D(DG(-1))
0.0001	-5.170074	0.130070	-0.672470	CointEq(-1)*

Source: Prepared by the researcher based on the . (Eviews 12)

As for the time lag D(DG(-1)), it shows the inverse effect of DG on GH, at a non-significant level of (0.0651). This means that an increase in domestic government debt by one unit will lead to a decrease in health spending by (0.18-%). This may be due to the fact that an increase in government debt in previous periods may prompt governments to reduce health spending in the current period to cope with debt service pressures or to achieve fiscal balance, resulting in a decrease in health spending.

Based on the above, Table (20) also shows, from another aspect, the value of the Unrestricted Error Correction Model (UECM), which is (-0.672470), negative and significant at a probability value of (Prob=0.0001). This confirms the existence of a short-term equilibrium relationship between the independent variable DG and the dependent variable GH, aligning with the long-term equilibrium relationship. This means that the Unrestricted Error Correction Model (UECM) explains that (0.67-%) of the short-term errors in GH from the previous period (t-1) can be corrected in the current period t in order to return to long-term equilibrium in the event of a shock or any change in the independent variable.

Fourth: Testing the Estimated Parameters in the Long Run

Table (21) shows that there is a positive effect of DG on GH, with a significance level of (0.0027). This means that an increase in domestic government debt by one unit will lead to an increase in health spending by (0.06%). This may be due to governments relying on debt to finance sustainable development programs and health infrastructure, which leads to increased health spending as part of strategies to improve public services and enhance healthcare. This reflects governments' commitment to improving quality of life and public health in the long term.

Table 21: Results of estimation of long-term parameters

Levels Equation Case 2: Restricted Constant and No Trend				
Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0027	3.241509	0.020216	0.065532	DG
0.0006	3.767905	400564.1	1509287.	C

Source: Prepared by the researcher based on the . (Eviews 12)

Fifth: Diagnostic Tests for Residuals

1. Test for Autocorrelation Problem

Table (22) reveals the results of the autocorrelation problem test, where we observe that the calculated probability value of F is (Prob=0.2645), which is greater than the (5%) level. This indicates that there is no problem with autocorrelation, and therefore, we should accept the null hypothesis stating that there is no autocorrelation issue among the random residuals and reject the alternative hypothesis.

Table 22: Results of the LM Autocorrelation Problem Test

Breusch-Godfrey Serial Correlation LM Test:			
0.2645	Prob. F(6,16)	1.427403	F-statistic
0.0836	Prob. Chi-Square(6)	11.15685	Obs*R-squared

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Source: Prepared by the researcher based on the . (Eviews 12)

2. Test for Heteroscedasticity Problem

Table (23) shows the results of the heteroscedasticity problem test for ((ARCH), where we observe that the calculated probability value of F is (Prob=0.1194), which is greater than the (5%) level. This indicates that there is no problem with heteroscedasticity, and therefore, we should accept the null hypothesis stating that there is no heteroscedasticity issue among the random residuals and reject the alternative hypothesis.

Table 23: Results of the Variance Difference Problem Test for ARCH

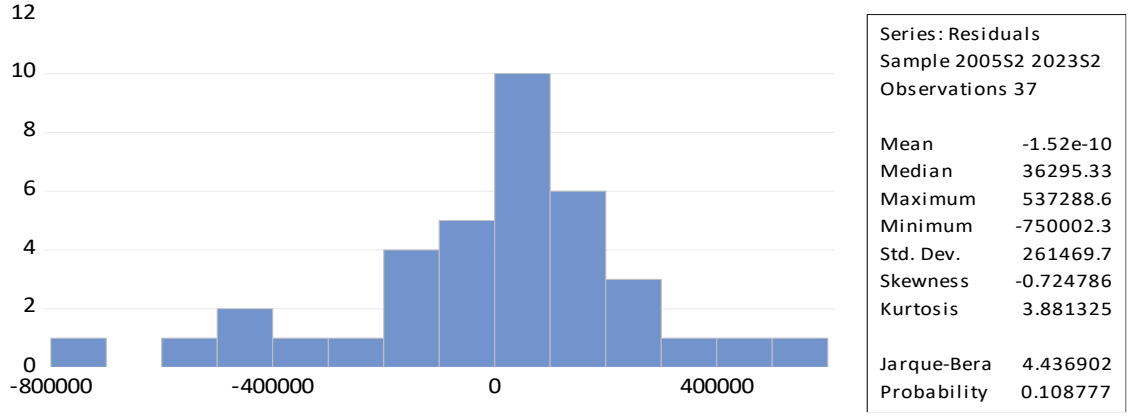
Heteroskedasticity Test: ARCH			
0.1194	Prob. F(1,34)	2.551683	F-statistic
0.1129	Prob. Chi-Square(1)	2.513170	Obs*R-squared

Source: Prepared by the researcher based on the . (Eviews 12)

3. Normality Distribution Test Histogram-Normality Test

Figure (8) shows the results of the normality distribution problem test for (Jarque-Bera), where we observe that its probability value is (Prob=0.108777), which is greater than the (5%) level , This means that there is no problem with the normal distribution, so here we must accept the null hypothesis that there is no problem of normal distribution of residues and reject the alternative hypothesis.

Figure 8: Normal distribution problem test results



Source: Prepared by the researcher based on the . (Eviews 12)

4. Structural Stability Test for the ARDL Model

Figure (9) shows the results of the structural stability test for (CUSUM), where we observe that the blue line in the figure falls within the critical boundaries marked by the red dots, indicating that the estimated parameters of the model are stable.

Figure (9): Results of the Structural Stability Test for (CUSUM)

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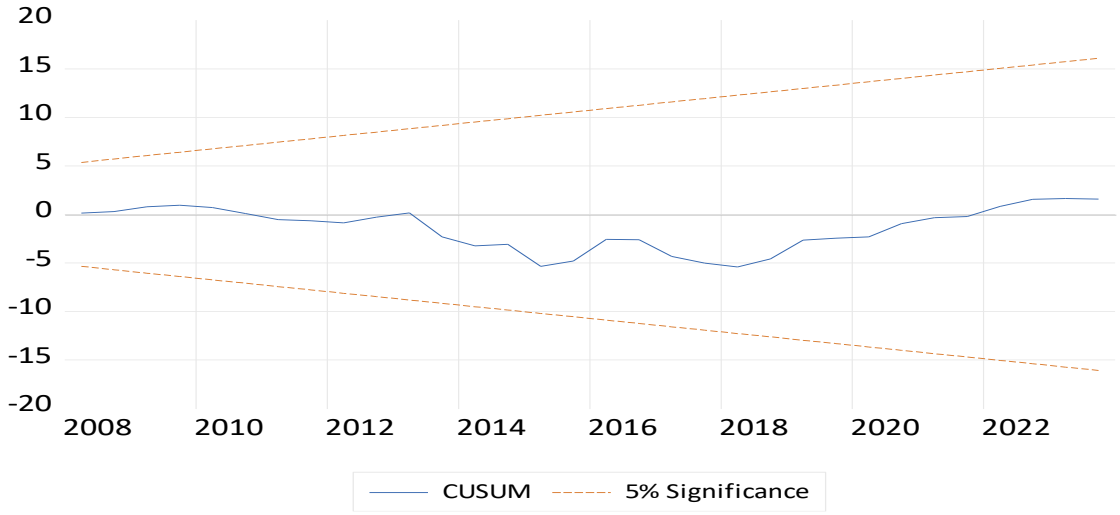

Source: Prepared by the researcher based on the . (Eviews 12)

CONCLUSIONS AND RECOMMENDATIONS

First: Conclusions

1. Based on the results obtained in the analytical and econometric section, the validity of the research hypothesis has been proven.
2. Treasury transfers to commercial banks and the central bank accounted for the largest share of the total internal government debt, with an average percentage of (50%) during the research period, while the average debt to the Ministry of Finance and loans from financial institutions and bonds were (37.5%), (10.7%), and (1.6%) respectively.
3. The commodity sectors accounted for the largest percentages in terms of contribution to the country's GDP compared to other economic sectors, such as distribution and services, due to the dominance of the mining and quarrying sector among all commodity sectors, with an average contribution percentage of (60%), while the average contribution percentages for distribution and service sectors were (22.9%) and (17.3%) respectively during the research period.
4. Spending on education contributed a greater percentage than spending on health during the research period, with an average contribution percentage of spending on education at (9.11%) of total public spending, while the average percentage of spending on health was (5.17%).
5. The econometric model demonstrated that internal government debt has both a negative and positive effect on GDP in the short term, while it only has a positive effect in the long term.
6. The standard model has shown that domestic government debt has both a positive and negative impact on education spending in the short term, while it only has a negative impact in the long term.
7. The results of the standard model indicate that domestic government debt has both a negative and positive effect on health spending in the short term, while it only has a positive effect in the long term.

Secondly: Recommendations

1. Policymakers should diversify funding sources to reduce reliance on treasury bills from commercial banks and the central bank, which can be achieved by increasing the issuance of government bonds and attracting foreign investments. Additionally, public debt management should be strengthened to ensure the sustainability of public finances.
2. The government should enhance the distributive and service sectors to achieve greater economic diversification. This can be accomplished by providing incentives for investment in these sectors and improving the necessary infrastructure for their growth, as well as working to improve the efficiency of the mining and quarrying sector to increase its added value.
3. Health spending should be increased to balance it with education spending, especially given the urgent need to improve healthcare services in Iraq. Part of public spending can be directed towards enhancing health infrastructure and training medical staff.
4. The government should manage public debt effectively to promote long-term economic growth, which can be achieved by improving the efficiency of public spending and directing investments towards projects with high economic returns.

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5. The government should monitor the impact of public debt on educational spending, particularly in the short term, and educational spending can be enhanced by increasing efficiency in resource use and directing it towards improving education quality.
6. The government should promote long-term health spending to ensure the sustainability of health services, which can be achieved by improving the management of health resources and directing investments towards health projects with long-term impact.

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Appendix 1: Research variables included in the measurement for the period (2004-2023)

Government spending on health	Government spending on education	GDP	Internal Government Debt	years
4	3	2	1	
GH	GS	GDP	DG	
683529.5	1717932	53235358.7	6061688	2004
1116137	1612644	73533598.6	6593960	2005
1116164	2074219	95587954.8	5645390	2006
1632017	2476727	111455813.4	5193705	2007
2898667	5262624	157026061.6	4455569	2008
3407138	5650308	130643200.4	8434049	2009
4167602	6784298	162064565.5	9180806	2010
4283434	7941936	217327107.4	7446859	2011
4921087	9497101	254225490.7	6547519	2012
6272867	10574821	273587529.2	4255549	2013
2827721	9936750	266332655.1	9520019	2014
5404272	9312073	194680971.8	32142805	2015
5044804	9732368	196924141.7	47362251	2016
3834515	10373294	225722375.5	47678796	2017
4302670	11856906	268918874.0	41822918	2018
6306218	12424790	276157867.6	38331548	2019
5757693	10396270	219768798.4	64246559	2020
7485283	10367901	301439533.9	69912394	2021
8235590	5516924	383064152.3	69495737	2022
8568077	2806705	332174700.0	70557515	2023

Appendix (1): Preparing the researcher based on tables (1, 2 and 3).